

# 410/420/430 Tractor Operator Instruction Book

**Tractor models applicable:**

For footstep tractor models:  
410,420,430  
Manufactured from January 2007.

**European market only.**

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# Tractor Identification

## Serial Numbers

**NOTE:** Observe the serial numbers of your tractor. Always quote the serial numbers in any communication to your Massey Ferguson Dealer.

Model

-----  
-----

Tractor Serial No. (Fig. 1)

-----

Engine Serial No. (Fig. 2)

-----

Owner or operator

-----  
-----  
-----  
-----  
-----  
-----

Nearest Massey Ferguson Dealer

-----  
-----  
-----

Phone

-----

Fax

-----

Date of delivery

-----

Expiration of Warranty

-----

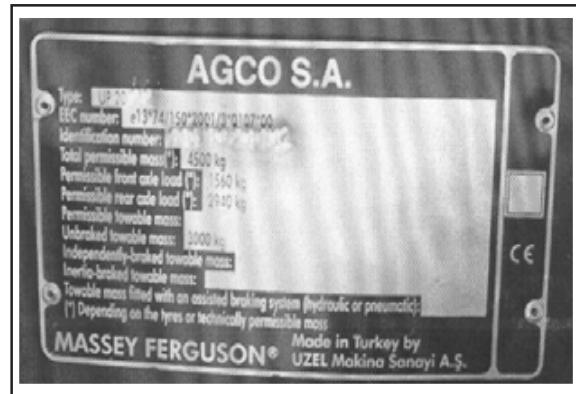


Fig. 1

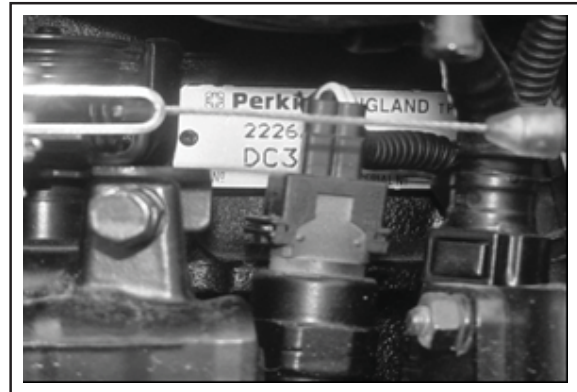


Fig. 2

# Introduction

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# Introduction

## Introduction

**NOTE:** *This book is published for worldwide distribution, and the availability of equipment shown either as basic or accessory may vary according to the territory in which the tractor is to be operated. Full details of equipment available in your area can be obtained from your Massey Ferguson Dealer. Use only Massey Ferguson approved attachments and equipment.*

The purpose of this book is to enable the owner and driver to operate the tractor in a safe manner. Providing that the instructions are followed carefully, the tractor will give years of service in the tradition of Massey Ferguson. The installation of the product on the farm by the Dealer gives the opportunity to ensure that these operating and maintenance instructions are understood. Always consult your Dealer if you do not understand any part of this book. It is important that these instructions are understood and observed. Daily maintenance should become a routine, and a record of hours in service should be kept.

When new parts are required it is important that only genuine Massey Ferguson service parts are used. Massey Ferguson Dealers supply genuine parts and can give advice regarding their fitment and use. Extensive damage may occur as a result of the fitment of parts of inferior quality. Customers are advised to buy their service parts only from an authorized Massey Ferguson Dealer.

Owing to wide variations in operating conditions, it is impossible for the Company to make comprehensive or definitive statements in its publications regarding performance or methods of use of its machines, or to accept liability for any loss or damage which may result from these statements, or from any errors or omissions. If the tractor is to be used for abnormal conditions which may be detrimental, (e.g. deep water or paddy fields) consult your Massey Ferguson Dealer for special instructions, or the warranty may be invalidated.

These tractors are designed solely for use in customary agricultural operations (intended use).

\*Use in any other way is considered as contrary to the intended use. Massey Ferguson accepts no liability for any damage or injury resulting from misuse and these risks must be borne solely by the user.

Compliance with, and strict adherence to, the conditions of operation, service and repair as specified by Massey Ferguson also constitute essential elements for the intended use.

These tractors should be operated, serviced and repaired only by persons familiar with all their particular characteristics and who are acquainted with the relevant safety rules (accident prevention). Customers are strongly advised to use an official Massey Ferguson Dealer in connection with any service problems and adjustments that may occur.

## Pre-delivery installation on the farm and Warranty

The Company, when selling new goods to their Dealers, gives a warranty which, subject to certain conditions, guarantees that the goods are free from defects in material and workmanship. Since this book is published for worldwide circulation, it is impossible to detail the exact terms and conditions of warranty that apply to a retail customer in any particular country. Purchasers of new Massey Ferguson equipment should request full details from their supplying Dealer. In accordance with the Company's policy of continuous improvement to its machines, alterations in the specifications of machines may be made at any time without notice. The Company accepts no responsibility for discrepancies which may occur between the specifications of its machines and the descriptions thereof contained in its publications.

## Pre-delivery and Installation on the farm

A Dealer is required to carry out certain activities when supplying a new Massey Ferguson tractor. These consist of a full pre-delivery inspection to ensure that the tractor supplied is ready for immediate use, and to give full instruction in the basic principles of operation and maintenance of the tractor. These instructions will cover instruments and controls, routine maintenance and safety precautions. All persons who will be concerned with the operation and maintenance of the machine should be present during this instruction period.

**NOTE:** *Massey Ferguson will not accept responsibility for any claim resulting from the fitment of non-approved parts or attachments, or unauthorized modification or alteration.*

### Warranty procedure

Correct installation on the farm, coupled with regular maintenance, will do much to prevent breakdowns. If, however, operating trouble is experienced during the warranty period, the following procedure must be adopted:

\*Immediately notify the Dealer from whom you purchased the tractor, quoting the Model and Serial Number. It is most important that there should be no delay, and you should realize that, even where the original failure is covered by warranty, if the failure is not repaired immediately, warranty cover may not apply.

\*Provide your Dealer with as much background information as you can. It will help him to know how many hours service has been achieved, the type of work on which you are engaged and the symptoms of the trouble.

It should be noted that normal maintenance services such as tuning, brake/clutch adjustments, and the supply of materials used to service the tractor (oil, filters, fuel and antifreeze) are not covered by the terms of warranty.

# Introduction

## Parts warning

The fitment of non Massey Ferguson parts may result in a part of substandard quality being used. Massey Ferguson will not take the responsibility for any loss, damage or liability resulting from the fitment of such parts, and, if fitted during the normal warranty period the manufacturer's guarantee may be invalidated.

## Moving to a new location

Only the Massey Ferguson Dealer from whom you purchased the tractor is responsible for the protection afforded by your warranty and, where possible, you should always take your tractor to him for repair. If, however, you move to another area or if your tractor should be working temporarily at some distance from the Dealer from whom it was purchased, you are recommended to obtain from that Dealer the name and address of the Massey Ferguson Dealer nearest to your new location and to ask for arrangements to be made for outstanding service warranty commitments to be transferred to the latter. If you have left the area in which the original Dealer operates and have not made arrangements with a new Dealer, the latter will readily provide assistance in an emergency but you will be charged at normal rates for any work undertaken unless:

\*You make it clear that the warranty has not expired, and

\*You give the repairing Dealer the opportunity to make suitable arrangements with the retailing Dealer.

## Service after Warranty

During the warranty period, you should have all your repairs and maintenance performed by your Massey Ferguson Dealer. This ensures that a detailed check is kept on the progress and performance of your new tractor.

In order to obtain the best results from your Massey Ferguson tractor, it is important that regular maintenance and service checks continue after the warranty period has expired. Make use of your local Massey Ferguson Dealer for all major tractor services; a trained mechanic will spot any problems between one service and the next.

The mechanics are regularly trained and updated on the product, servicing techniques and the use of modern service tools and diagnostic equipment. They receive regular Service Bulletins, have all Workshop Manuals and other such technical information to ensure that the repair or service is to the standard required by Massey Ferguson.

## Safety

The safety of the operator is one of the main concerns in designing and developing a new tractor. Designers incorporate as many safety features as is possible in constructing our tractors. However, every year many accidents occur which could have been avoided by a few seconds thought and a more careful approach to handling farm machinery and implements. Read and practice the safety instructions detailed in the next section of this book.



**WARNING:** *In some of the illustration used in this Operator Instruction Book, panels or guards may have been removed for clarity. Never operate the tractor without these components in position. If the removal of panels or guards is necessary to make a repair, they **MUST** be replaced before operation.*

# Introduction

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# Safety Notes

## Safety Alert Symbol and Terms

This safety alert symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



The safety alert symbol identifies important safety messages on machines, safety signs, in manuals, or elsewhere.

When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

### Why is SAFETY important to you?

\* ACCIDENTS DISABLE and KILL \*

\* ACCIDENTS are COSTLY \*

\* ACCIDENTS can be AVOIDED \*

---

### Tractor and Implement Safety

The tractor is a source of power - Mechanical and Hydraulic.

On its own, the tractor is of little practical value. Only when used in conjunction with an implement or other attachment does it become a working unit.

This instruction book is compiled to cover those safe working practices that are associated with the base tractor operation.

It does not cover all operation and safety instructions relevant to all known implements and attachments that may be fitted at the time of tractor delivery or at some future date.

It is essential that operators use and understand the relevant instruction manual of such implements and attachments.

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#### Introduction to safety

This safety section of your Operator Instruction Book is intended to point out some of the basic safety situations which may be encountered during the normal operation and maintenance of your FOOTSTEP (ROPS) tractor, and to suggest possible ways of dealing with these situations. This section is NOT a replacement for other safety practices featured in other sections of this book.

Additional precautions may be necessary, depending on attachments used and conditions at the work site or in the service area. Massey Ferguson has no direct control over tractor application, operation, inspection, lubrication, or maintenance. Therefore it is YOUR responsibility to use good safety practices in these areas.

#### A word to the operator

It is YOUR responsibility to read and understand the safety section in this book before operating your tractor.

You must follow these safety instructions that take you step by step through your working day. In reading this section, you will note that illustrations have been used to highlight certain situations. Each illustration is numbered and the same number appears in the text in parenthesis. This number is placed at the end of the written text that refers to the illustration.

Remember that YOU are the key to safety. Good safety practices not only protect you, but also the people around you. Study the features in this manual and make them a working part of your safety programme. Keep in mind that this safety section is written only for this type of machine. Practice all other usual and customary safe working precautions, and above all - **REMEMBER - SAFETY IS YOUR RESPONSIBILITY. YOU CAN PREVENT SERIOUS INJURY OR DEATH.** Use only AGCO - Massey Ferguson approved attachments and equipment.



# Safety Notes

## Danger, warning and caution

Whenever you see the words and symbols shown below, used in this book and on decals, you **MUST** take note of their instructions as they relate to personal safety.



**DANGER:** This symbol together with the word **DANGER** indicates an imminently hazardous situation that, if not avoided, will result in **DEATH OR VERY SERIOUS INJURY**.



**WARNING:** This symbol together with the word **WARNING** indicates a potentially hazardous situation that if not avoided could result in **DEATH or SERIOUS INJURY**.



**CAUTION:** This symbol together with the word **CAUTION** is used to indicate a potentially hazardous situation that, if not avoided, may result in **MINOR INJURY**.

**IMPORTANT:** The word **IMPORTANT** is used to identify special instructions or procedures which, if not strictly observed, could result in damage to, or destruction of the machine, process or its surroundings.

**NOTE:** The word **NOTE** is used to indicate points of particular interest for more efficient and convenient repair or operation.

## Decals

**WARNING: DO NOT remove or obscure Danger, Warning, Caution or Instruction Decals. Replace any Danger, Warning, Caution or Instruction Decals that are not readable or are missing. Replacement decals are available from your Dealer in the event of loss or damage. The actual location of these Safety Decals is illustrated at the end of this section.**

If a used tractor has been purchased, refer to the illustrations at the end of this section to ensure that all the safety warning decals are in the correct position and are readable.

## Follow a safety program For safe operation

For safe operation of an agricultural tractor, you must be a qualified and authorized operator. To be qualified you must understand the written instructions supplied in this Operator Instruction Book, have training, and know the safety rules and regulations for the job. Some regulations specify that no one under the age of 16 years, for example, may operate power machinery. This includes tractors. It is your responsibility to know what these regulations are, and obey them, in the operating area or situation. These will include, but are not limited to, the following instructions for safe tractor operation.



**WARNING:** An operator should not use alcohol or drugs which can affect his alertness or co-ordination. An operator on prescription or 'over the counter' drugs needs medical advice on whether or not he or she can safely operate machines.

## Observe the following

\***DO NOT** allow children or unqualified persons to operate your tractor. Keep others away from your area of work.

\*Securely fasten your seat belt when the tractor has a ROPS (Roll Over Protective Structure) frame in the upright position or is fitted with a cab.

\*Where possible, avoid operating the tractor near ditches, embankments and holes. Reduce speed when turning, crossing slopes, and on rough, slippery, or muddy surfaces.

\*Stay off slopes too steep for safe operation.

\*Watch where you are going, especially at row ends, on roads, and around trees.

\***DO NOT** permit others to ride on the tractor or the implement.

\*Hitch only to the drawbar and hitch points recommended, and never above the centre line of the rear axle.

\*Operate the tractor smoothly - no jerky turns, starts or stops. When the tractor is stopped, apply the parking brake securely. Lower the implement and remove the key.

\***DO NOT** modify or remove any part of the equipment and **DO NOT** use attachments unless they are properly matched to your tractor.



# Introduction

## Protective structures ROPS

A Roll Over Protective Structure (ROPS) and seat belt is fitted as standard equipment to the footstep tractor at the time of factory assembly. If the ROPS was removed by the original purchaser or has been removed, it is recommended that you equip your tractor with a Roll Over Protective Structure and a seat belt. ROPS are effective in reducing injuries during overturn accidents. Overturning a tractor without ROPS can result in serious injury or death (Fig. 3).

If a fold down ROPS is installed **DO NOT** wear seat belt when the ROPS is in the folded down position.

### Operation

\*Before using the tractor ensure that the ROPS frame is not damaged, that it is securely fastened to the tractor and if a hinged section is fitted that it is in the raised position and secured.

\*If the ROPS has been removed from the tractor, or folded down for a specific operation, it must be refitted or erected immediately afterwards using the proper hardware and applying the recommended torque values.

\***DO NOT** attach chains, ropes, or cables to the ROPS for pulling purposes; this will cause the tractor to tip backwards. Always pull from the tractor drawbar.

\*Always wear your seat belt - adjusted snugly except when operating with a folded down ROPS.

\*Check the seat belt for damage. A damaged seat belt must be replaced (Fig. 4).

### Damage to the ROPS

If the tractor has rolled over or the ROPS has been damaged (such as striking an overhead object during transport), the ROPS must be replaced to provide the original degree of protection.

After an accident, check for damage to the ROPS, operator's seat, seat belt and seat belt mountings. Before you operate the tractor, replace all damaged parts.

**DO NOT WELD, DRILL, BEND OR STRAIGHTEN THE ROPS.** To do so reduces the protection it offers.

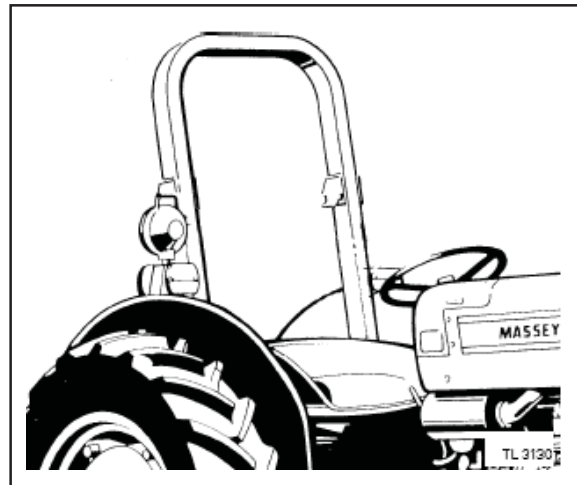


Fig. 3

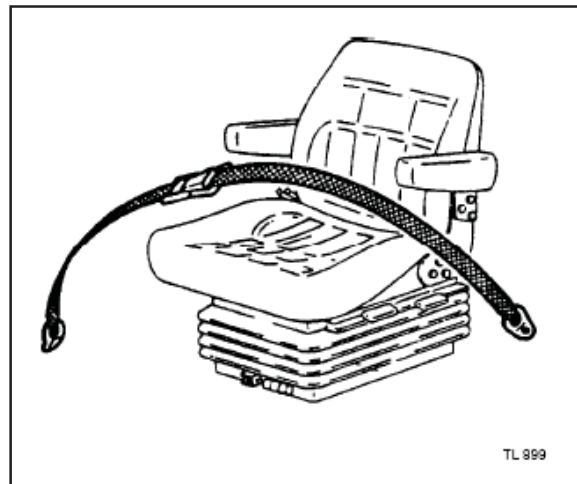


Fig. 4

# Safety Notes

## Prepare for safe operation Protect yourself

Wear all the protective clothing and personal safety devices issued to you or called for by job conditions. Don't take chances (Fig. 5).

You may need:

- \*A hard hat.
- \*Safety glasses, goggles, or face shield.
- \*Hearing protection.
- \*Respirator or filter mask.
- \*Foul weather clothing.
- \*Reflective clothing.
- \*Heavy gloves (neoprene for chemicals, leather for rough work).
- \*Safety boots.

**DO NOT** wear loose clothing, jewelry or other items and tie up long hair which could entangle in controls or other parts of the tractor.

Note where fire extinguishers and first-aid or emergency equipment is kept and get to know where to find help in a hurry. Make sure you know how to use this equipment (Fig. 6).

## Know your equipment

Know your tractor. Know how to operate all equipment on your machine and the implements and attachments used with it. Know the purpose of all the controls, gauges and dials. Know the rated load capacity, speed range, braking and steering characteristics, turning radius, and operating clearances. Keep in mind that rain, snow, ice, loose gravel, soft ground, etc. can change the way your tractor operates. *Under poor conditions, slow down and be extra careful, engage power front axle, if fitted.*

Study the **DANGER**, **WARNING**, or **CAUTION** safety signs on your tractor and the information signs also. **READ THIS OPERATOR INSTRUCTION BOOK BEFORE STARTING THE ENGINE.**

**STUDY IT BEFORE YOU START WORK (Fig. 7). IF THERE IS SOMETHING IN THE MANUAL YOU DON'T UNDERSTAND, ASK SOMEONE (such as your equipment Dealer) TO EXPLAIN IT TO YOU.**

**IMPORTANT:** *This manual covers general safe practices for agricultural tractors. It must always be kept with the tractor. For further copies contact your Massey Ferguson Dealer*

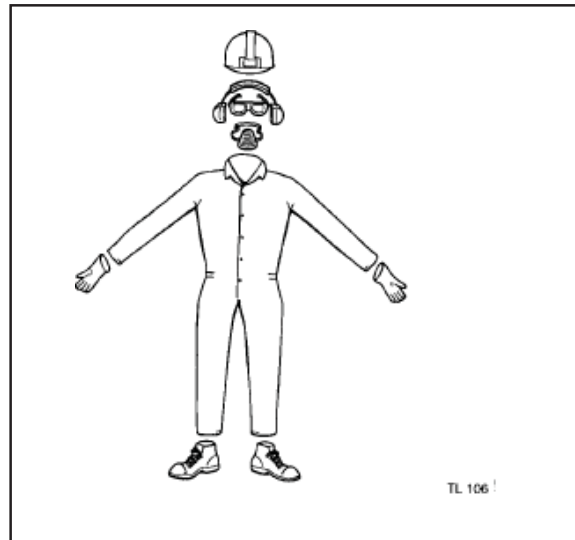


Fig. 5



Fig. 6

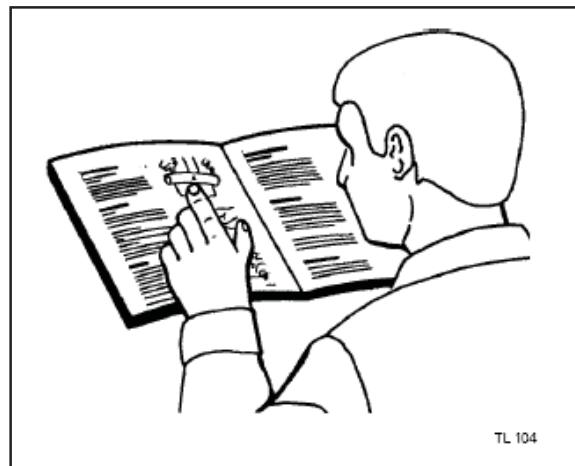


Fig. 7

## Safety Notes

Use all available protective and safety devices. Keep all protective devices in place and securely fastened. Make certain all guards, shields and safety signs are properly installed, as specified, and are in good condition.

To help keep you and others around you safe, your tractor must be equipped with:

- \*Roll Over Protective Structure (ROPS), and seat belt.

- \*Tractor PTO shield.

Your tractor may also need:

- \*Rear view mirror.

- \*Fire extinguisher.

- \*SMV (slow moving vehicle) emblem, additional safety guards, lights or decals and a back up alarm.

Know which devices are required for safe operation of your tractor. Use them. Make sure they are in place and in good condition. **DO NOT** remove or disconnect any safety device.

Check the equipment

Before you begin your working day, take time to check your tractor and ensure that all systems are in good operational condition.

- \***DO NOT** smoke while refuelling the tractor. Keep any type of open flame away (Fig. 8).

- \*Stop the engine and wait for it to cool before refuelling.

- \*Check for loose, broken, missing, or damaged parts. Have everything put into good repair. Make certain all safety devices are in place.
- \*Check ROPS and seat belt for damage. A damaged ROPS or seat belt (Fig. 3) **MUST** be replaced.

- \*Ensure that implements and attachments are properly installed and that the tractor and implement PTO rev/min ratings match.

- \*Check the tires for cuts, bulges and correct pressure. Replace worn or damaged tires.

- \*Check the engine oil level and add oil if required.

- \*Perform all maintenance procedures outlined in the maintenance and adjustment section of this manual.

- \*Check foot and parking brakes for proper operation, adjust if necessary.

- \*Check that the PTO driveline locking devices are latched.

- \*Check that the tractor PTO shield and driveline guards are in place and operating properly.

- \*Check the tractor and implement hydraulic system. Have any leaks or damaged parts repaired or replaced.

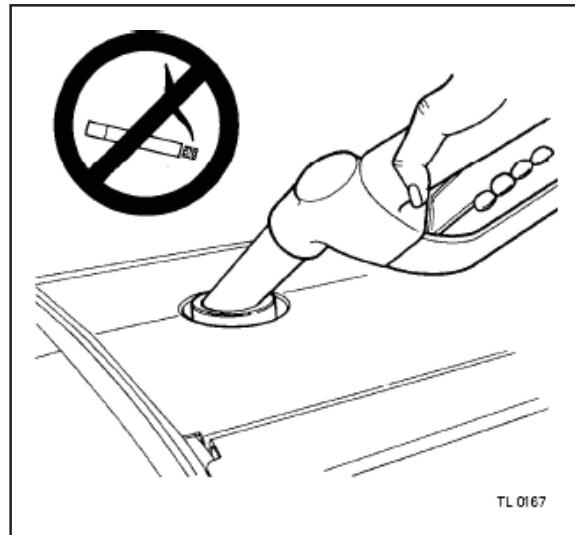


Fig. 8

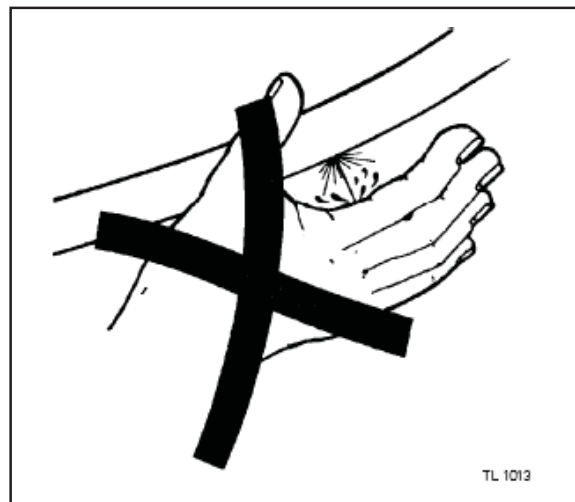


Fig. 9



**WARNING:** Diesel fuel or hydraulic fluid under pressure can penetrate the skin or eyes and cause serious personal injury, blindness or death. Fluid leaks, under pressure, may not be visible.

Use a piece of cardboard or wood to find leaks. **DO NOT** use your bare hand. Wear safety goggles for eye protection. If any fluid is injected into the skin, it **MUST** be surgically removed within a few hours by a doctor familiar with this type of injury (see Fig.9)

## Safety Notes

Before applying pressure to the fuel or hydraulic system, be sure all connections are tight and that lines, pipes, and hoses are not damaged. Before disconnecting fuel or hydraulic lines, be sure to relieve all pressure. Make sure that all hydraulic lines are correctly installed and not crossed.



**WARNING:** *Liquid cooling systems build up pressure as the engine gets hot. Before removing the radiator cap, stop the engine and let the system cool. Check the engine cooling system and add coolant as required.*

### Clean the tractor

- \*Keep work surfaces and engine compartments clean.
- \*Before cleaning the machine, always lower implements to the ground, place transmission in neutral, engage the parking brake, shut off the engine and remove the key.
- \*Clean steps, pedals and floor. Remove grease or oil. Brush away dust or mud. In winter, scrape away snow and ice. Remember - slippery surfaces are dangerous.
- \*Remove or put away tools, buckets, chains and hooks.

### Protect the environment

- \*It is illegal to pollute drains, water courses or soil. Use authorized waste disposal facilities, including civic amenity sites and garages providing facilities for disposal of used oil. If in doubt, contact your local authority for advice.

### Servicing the tractor

- \***DO NOT** service the tractor while the engine is running or hot, or if the tractor is in motion (Fig. 10).
- \*Before making adjustments to, or servicing the electrical system, disconnect the battery negative(-) cable first.
- \*To prevent fires or explosions keep open flame away from the battery or cold weather starting aids. To prevent sparks which could cause explosions use jumper cables according to instructions.
- \*When making repairs or adjustments it is recommended that you consult your Massey Ferguson Dealer, and have the work carried out by trained personnel.
- \*The implement and/or tractor must be supported on suitable wooden blocks or stands. NOT a hydraulic jack.
- \*Check all nuts and bolts periodically for tightness, especially wheel hub and rim nuts. Tighten to the prescribed torque values.
- \*Check the brakes regularly. Adjust when necessary.



Fig. 10

# Safety Notes

## Starting

### Warn personnel before starting

Before starting, walk completely around the tractor and any attached equipment. Make sure that no one is under it, on it, or close to it. Let other workers and bystanders know you are starting up and don't start until everyone is clear of the tractor, implements and towed equipment. Ensure that all bystanders, particularly children, are a suitable distance away before starting the engine.

### Mount and dismount safely

Always use 'three point contact' with the machine, and face the machine when you mount it. (Three point contact means both hands and one foot or one hand and both feet are in contact with the machine at all times during mounting and dismounting). Clean your shoes and wipe your hands before climbing on. Use handrails, grab handles, ladders or steps (as provided) when mounting or dismounting. **DO NOT** use control levers as a hand hold and never step on foot controls when mounting or dismounting. **DO NOT** attempt to mount or dismount from a moving tractor. **DO NOT** jump off a tractor other than in an emergency.



Fig. 11

### Start safely



**WARNING:** Before starting the engine make sure there is plenty of ventilation. **DO NOT** operate the engine in a closed building. The exhaust fumes may cause asphyxiation.

Always start the engine from the operator's seat with all the transmission levers and the PTO lever in neutral. Make sure that the tractor's dual brake pedals are locked together at all times unless you are making turns in the field which require independent use of the brakes. Make sure the brakes are properly adjusted so that both brakes engage at the same time. Adjust the seat, fasten the seat belt, apply the parking brake and put all controls in neutral before starting up.



**DANGER:** Start the engine, with the starter key, from the operator's seat only. **DO NOT** attempt to start the engine by shorting across the starter terminals. The machine will start in gear if the neutral start circuit is bypassed. This could cause serious injury or death to anyone in the vicinity of the tractor (Fig. 11). Ensure that the engine starter solenoid cover is always in position.

### Follow recommended starting procedures

Follow the starting procedures recommended in the Operation section of this Operator Instruction Book. This includes normal starting, cold starting, and the use of starting fluids.

### Test the controls

After starting, re-check all gauges and lights. Make sure everything is functioning correctly. If the tractor does not respond correctly when each control is operated, **DO NOT** use the machine until the fault is rectified.



Fig. 12

### Starting fluid



**WARNING:** **DO NOT** use aerosol types aids such as ether (Fig. 12). Such use could result in an explosion and personel injury.



# Safety Notes

## Work safely



**WARNING:** An unbalanced tractor could overturn and cause injury or death. Make sure front frame counterweights, wheel weights and wheel ballast are used as recommended by the manufacturer. **DO NOT** add extra counterweights to compensate for an overloaded tractor, it is recommended to reduce the load. Keep all parts of your body inside the operator's compartment

### Make the right moves

Make sure your tractor is ready for the job it must do. Know the rated load capacities of your tractor and never exceed them. Be certain that any equipment or implements you intend to use **DO NOT** exceed the load rating of your tractor. Be sure the tractor and implement PTO speed match. Keep in mind that tractors normally operate on uneven, unpaved, and often bumpy or sloping surfaces. Operating conditions can reduce the amount of weight you should carry or pull.

### Follow safe operating practices

- \*Operate the controls smoothly - don't jerk the steering wheel or other controls.
  - \***DO NOT** get on or off a moving tractor. Keep a firm grip on the steering wheel at all times, with the thumbs clear of the spokes when driving the tractor.
  - \*Make sure you have adequate clearance in all directions for tractor, cab, ROPS and implement.
  - \***DO NOT** play games with a tractor or equipment. Use only for intended purpose.
  - \***DO NOT** attempt to work the controls except from the operator's seat.
  - \***DO NOT** carry passengers (Fig. 13).
  - \*Before dismounting, always disengage the PTO, lower all attachments and implements to the ground, place the tractor in neutral, engage parking brake, shut off the engine and remove the key.
- DO NOT** touch, lean on, or reach through any implement mechanism or permit others to do so. Stay alert. Should something break, come loose, or fail to operate on your equipment, stop work, lower equipment to the ground, shut off the engine, inspect the machine and have repairs or adjustments made before resuming operation.

### Watch out for others

\*Be aware of what is going on. **DO NOT** allow an untrained or unqualified person to operate your tractor. They could injure themselves or someone else.



Fig. 13



Fig. 14



**WARNING:** Your tractor is a one-person machine. **DO NOT** permit others to ride on the tractor or the implement (Fig. 13). **DO NOT** allow anyone to ride on the implements or other equipment including trailers, except on certain harvesting equipment, specifically designed for riders during the actual harvest operation only (not during transport). Such equipment must have provision for a safe riding area. **DO NOT** allow children on the tractor.

- \*Be certain you can control both speed and direction before moving. Move slowly until you are sure that everything is operating properly. After starting, recheck the steering, right and left. Be certain you have full steering and brake control. If differential is locked, **DO NOT** operate at high speed or turn the tractor until the differential lock is disengaged.
- \***DO NOT** lift a load over anyone (Fig. 14).

## Safety Notes

\*Keep others away from your operation. **DO NOT** allow anyone to stand or pass under a raised implement (Fig. 14).

\***DO NOT** lift objects that can not be contained in the bucket, get the appropriate attachment. **DO NOT** allow anyone to stand on the ROPS or fenders.

\*When using a loader, avoid sudden stops, starts, turns, or change of direction. Keep loads close to the ground when transporting.

\***DO NOT** stand (or allow anyone else to stand) in front of, under, or behind loaded or loading equipment. **DO NOT** drive a tractor up to someone standing in front of a fixed object.

\*Keep others away from universal joints, hitches, drawbar, lift arms, PTO drives, cylinders, belts, pulleys, and other moving parts. Keep all shields and guards in place.



**WARNING: DO NOT stand, or allow anyone else to stand, between the tractor and implement unless the engine is turned off and the parking brake is engaged, the transmission is in neutral, the key is removed, and all attachments or implements are lowered to the ground.**

### Risk of overturning

For your safety, it is strongly recommended that all footstep tractors are fitted with Roll Over Protective Structures (ROPS) and seat belts.

In the event of an overturn with a tractor (Fig. 15) fitted with a cab or ROPS, hold the steering wheel firmly and **DO NOT** attempt to leave the seat until the tractor has come to rest.

To avoid side overturns

\*Set the wheel track at the widest setting suitable for the job being done.

\*Lock the brake pedals together before driving at transport speeds.

\*Reduce speed to match operating conditions. If the tractor is equipped with a front-end loader, carry the bucket and load as low as possible.

\*Make wide slow turns at reduced speed. Don't let your tractor bounce. You may lose steering control.

\*Don't pull a load too heavy for your tractor. It could run away on the down slope or the tractor could jack-knife around a towed load.

\*Don't brake suddenly. Apply brakes smoothly and gradually.

\*When going down a slope, use the throttle to slow the tractor engine and use the same gear range you would use to go up the slope. Shift into gear before you start downhill.

\*Engage powered front axle (if fitted), this will give four wheel braking.

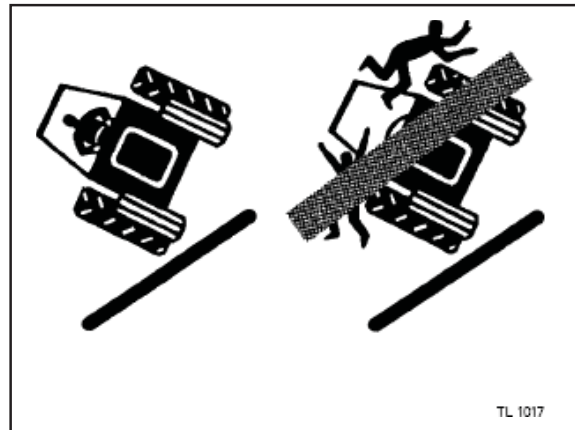


Fig. 15



**WARNING: DO NOT disengage the clutch or attempt to shift gear after you have started downhill.**

\*It is less likely that the tractor will overturn if you travel straight up or down a steep slope rather than across it.

\*Avoid crossing steep slopes if possible. If you must do so, avoid any holes or depressions on the downhill side. Avoid any stumps, rocks, bumps or raised areas on the uphill side. When operating near ditches and banks, always keep your tractor behind the shear line (Fig. 16). Avoid ditches, embankments and river-banks which might cave in.

\*If it is necessary to cross a steep slope, avoid turning uphill, slow down and make a wide turn. Travel directly up or down the slope, never across it. When traveling up or down a slope, keep the heavy end of the tractor on the uphill side.

\*If when traveling across a slope with side mounted implements, keep the implement on the uphill side. Don't raise the implements. Keep them as low to the ground as possible when crossing a slope.

\*When towing a load at transport speed or in the field, lock the drawbar in the centre position and use a safety chain.

\***DO NOT** use your tractor to round up farm animals.



# Safety Notes

## To avoid rear overruns



**WARNING:** Hitching to the rear axle, or any other point above the swinging drawbar, can cause a rear overturn.

\***DO NOT** pull anything using the top link connection, or from any point above the centre line of the rear axle. Always use an approved Massey Ferguson drawbar, and only use a drawbar pin that locks in place.

\*High hitching can cause rear overturn, which may cause serious injury or death. Hitch loads to the drawbar only.

\*Only use a three-point linkage drawbar when stays are fitted to keep it in the down position.

\*Use front counterweights to increase tractor stability when towing a heavy load or to counterbalance a heavy rear mounted implement (Fig.17).

\*Start forward slowly and gradually increase your speed. **DO NOT** rev the engine or drop the clutch. If the tractor is attached to a heavy load, or immovable object, improper clutching may cause overturn.

\*If the front end of the tractor starts to lift, reduce your speed and, if necessary, disengage the clutch.

\*If your tractor is bogged down in mud or frozen to the ground, **DO NOT** attempt to drive forwards. The tractor can rotate around its rear wheels and overturn. Lift any attached implement and attempt to BACK OUT. If this is not possible, tow it out with another vehicle.

\*If you get stuck in a ditch, BACK OUT, if possible. If you must go forward, do it slowly and carefully.

\*A bare tractor or tractor with rear mounted attachments should be backed up the slope in reverse and travel forward downhill.

\*A tractor with a loaded front-end bucket should be backed down the slope and travel forward uphill. Keep the loader bucket as low as possible.

\*Always keep the tractor in gear when going downhill. **DO NOT** permit the tractor to coast with clutch disengaged or transmission in neutral.

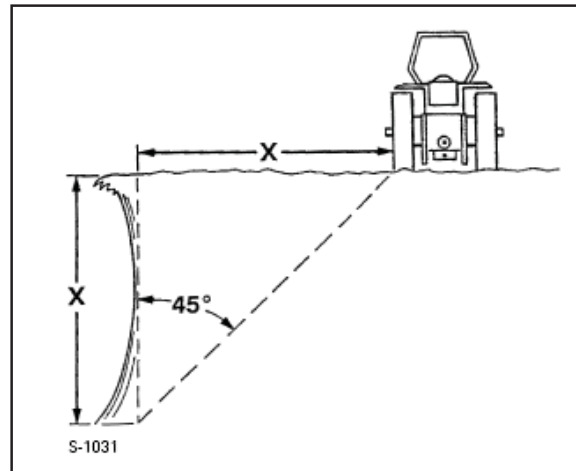


Fig. 16

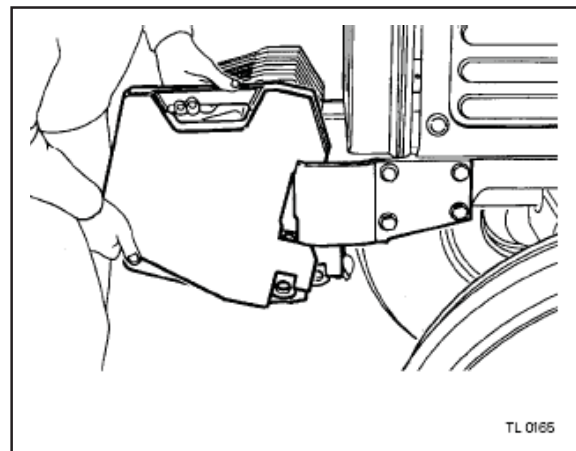


Fig. 17

## Safety Notes

### General operating hazards

\*Ensure that the PTO shield (1) is in place and that the PTO cap (2) is fitted when the PTO driveline is not in use (Fig. 18).

\*Before attaching, detaching, cleaning or adjusting PTO driven implements, disengage the PTO, stop the engine, remove the key, and make sure that the PTO driveline has stopped.

\*Ensure that all the PTO driveline guards are in place and observe all safety decals (Fig. 19).

\*Be sure everyone is clear of your machine before engaging the PTO. For stationary PTO operation, always place transmission in neutral, engage parking brake, and chock both tractor and implement wheels.

\*When operating mobile PTO driven equipment, **DO NOT** leave the tractor seat until the PTO drive is disengaged, the transmission is in neutral, the parking brake is engaged, the engine shut off and the key removed.

\***DO NOT** use PTO adaptors, reducers or extensions as they extend the PTO coupler and universal joint out beyond the protection offered by the PTO shield.

\*The top link and lift rods must not be extended beyond the point where threads begin to show.



**DANGER: DO NOT attempt to unplug the hydraulic connections, or adjust an implement with the engine running or the PTO drive in operation. To do so may result in very serious injury or death.**

\*When using chemicals, carefully follow the chemical manufacturer's instructions for use, storage and disposal. Also follow the chemical application equipment manufacturer's instructions.

\*When operating under poor visibility conditions, or in the dark, use your tractor field lights and reduce your ground speed. **DO NOT** use your field lights when travelling on a roadway because rear pointed white lights may be illegal except when reversing and may confuse following drivers.

\*Operate your tractor with the wheels set at the widest setting possible, consistent with the particular task you are performing. To adjust wheel settings refer to Maintenance and Adjustment section.

\*Reduce your speed when operating over rough or slippery ground and when foliage restricts your view of hazards.

\***DO NOT** make sharp turns at high speed.

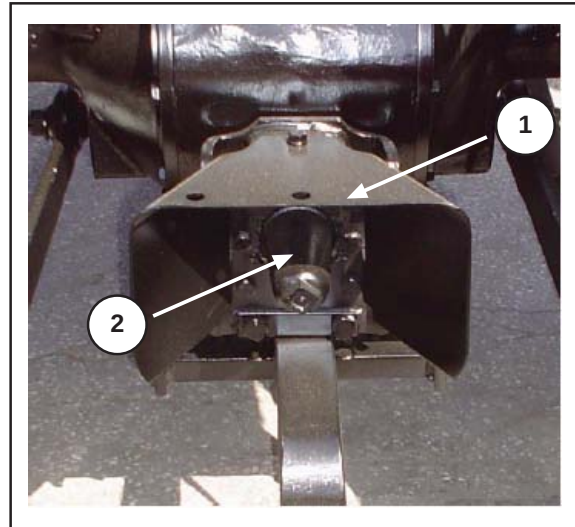


Fig. 18



Fig. 19

# Safety Notes

## Implements and attachments



**WARNING:** A front-end loader (bucket or forks) must be equipped with a suitable restraining device to prevent the load (bales, fence posts, rolls of fence, wire etc.) from rolling down the lift arms into the operator's compartment and crushing the driver when the loader is raised. Inadequately secured objects could also fall and injure bystanders.

\*Three-point hitch and side mounted implements make a much larger arc when turning than towed equipment. Make certain to allow sufficient clearance for turning. Use only Massey Ferguson approved attachments and implements.

\*When using attachments or implements with the tractor, be sure to thoroughly read the Operator Instruction Book for that attachment or implement and follow its safety instructions.

\***DO NOT** overload an attachment or towed equipment. Use proper counter-weights to maintain tractor stability. Hitch loads to the drawbar only.

\*A safety chain will help control drawn equipment should it be accidentally separated from the drawbar while transporting. Using the appropriate adaptor parts, attach the chain to the tractor drawbar support or other specified anchor location. Provide only enough slack in the chain to permit turning. See your Massey Ferguson Dealer for a chain with a strength rating equal to, or greater than the gross weight of the towed machine (Fig. 20).

\*Make sure any towed implements are equipped with a safety chain linking tractor and implement.

\*Pull only from the approved drawbar. Towing or attaching to other locations may cause the tractor to overturn (Fig. 21).

### Safety - towing

\*For towed equipment **WITHOUT** brakes, **DO NOT** tow equipment: at speeds over 32 km/h (20 miles/hour), that, when fully loaded, weighs more than 1.5 times the weight of the towing unit.

\*For towed equipment **WITH** brakes, **DO NOT** tow equipment: at speeds over 40 km/h (25 miles/hour), that, when fully loaded, weighs more than 4.5 times the weight of the towing unit.

**NOTE:** Tractor requires correct trailer braking equipment be installed and connected to the equipment. Stopping distance increases with speed and weight of towed loads, and on hills and slopes. Towed loads with or without brakes that are too heavy for the tractor or are towed too fast can cause loss of control. Consider the total weight of the equipment and its load.

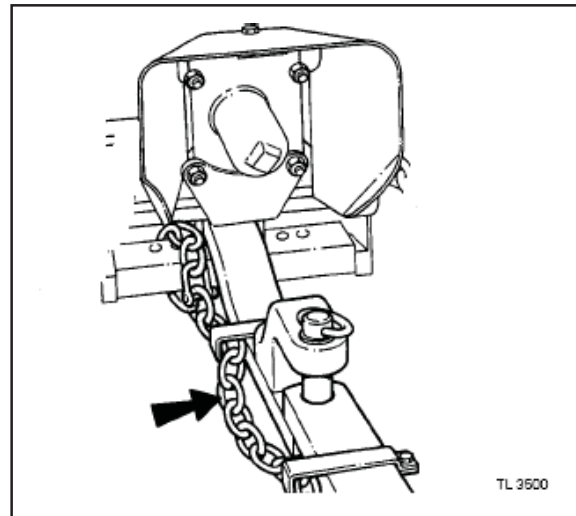


Fig. 20

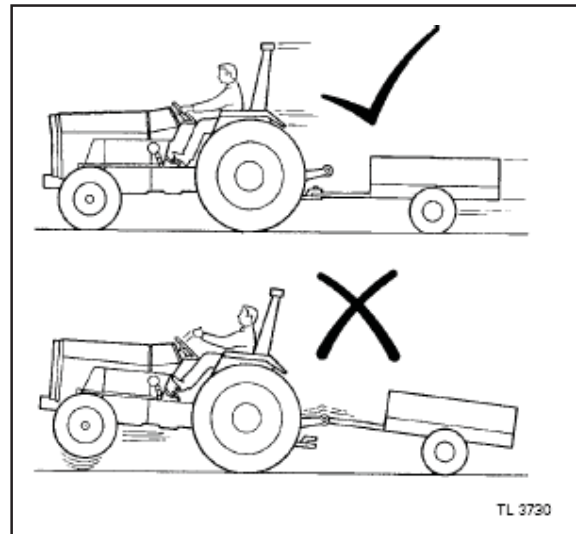


Fig. 21

## Road transport

**BEFORE** operating your tractor on a public road, a number of precautions must be taken.

\*Familiarize yourself with - and obey - all laws appropriate to your tractor.

\*Lock your brake pedals together.

\*Raise all implements to their transport position and lock them in place.

\*Place all implements into their narrowest transport configuration.

\*Disengage the PTO and differential lock.

\*Make sure any required clearance flags or hazard lights are in place and in working order.

\*Make sure you use a proper hitch pin with a clip retainer.

\*Clean all reflectors and road lights, front and rear, and be certain they are in working order.

## Safety Notes

\*Make sure tractor and equipment are equipped with Slow Moving Vehicle (SMV) (Fig. 22) signs and beacon warning lamp.

### Rules of the road

WHEN operating your tractor on a public road a number of precautions must be taken.



**WARNING: DO NOT allow any passengers on the tractor or towed equipment.**

- \*Know the route you are going to travel.
- \*Use flashing lights or beacon when travelling on roads, day or night, unless prohibited by law.
- \*Use caution when towing a load at transport speeds especially if the towed equipment is NOT equipped with brakes. Observe all local or national regulations regarding the road speed of your tractor.
- \*Use extreme caution when transporting on snowcovered or slippery roads.
- \*Wait for traffic to clear before entering a public road.
- \*Beware of blind in intersections. Slow down until you have a clear view.
- \***DO NOT** attempt to pass at any intersection.
- \*Slow down for turns and curves.
- \*Make wide, gentle turns.
- \*Signal your intent to slow, stop or turn.
- \*Shift to a lower gear before going up or down hills.
- \*Keep tractor in gear. DO NOT coast with the clutch disengaged or transmission in neutral.
- \*Stay out of the path of oncoming traffic.
- \*Drive in your correct lane keeping as near to the curb as possible.
- \*If traffic builds up behind you, pull off the road and let it go by.
- \*Drive defensively. Anticipate what other drivers might do.
- \*When towing a load, start braking sooner than normal and slow down gradually.
- \*Watch out for overhead obstructions.
- \*Make sure that the load does not obscure warning, any other lights, or the SMV (Fig. 22).

### After operation

When stopping at any time, bring the tractor to a complete halt, apply the parking brake, disengage the PTO, place all gear shift levers in neutral, lower the implement to the ground, stop the engine and remove the key BEFORE leaving the seat.

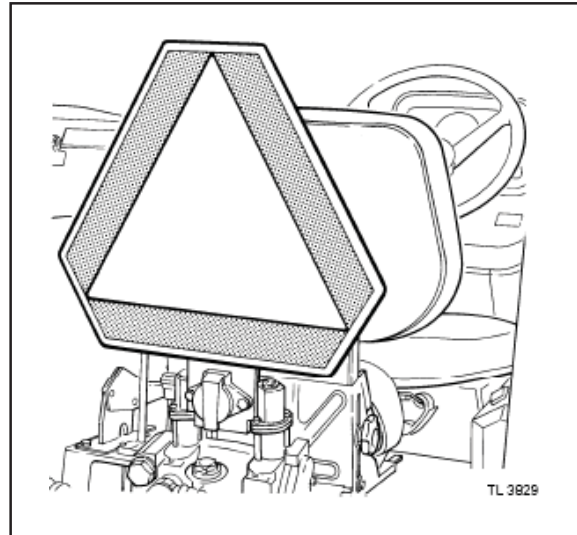


Fig. 22



**DANGER: reverse shuttle: Always place transmission control lever in neutral and engage handbrake before leaving operator's seat. Remove "START" key if unit is to be left unattended.**

# Safety Notes

## Safety Decals and Locations

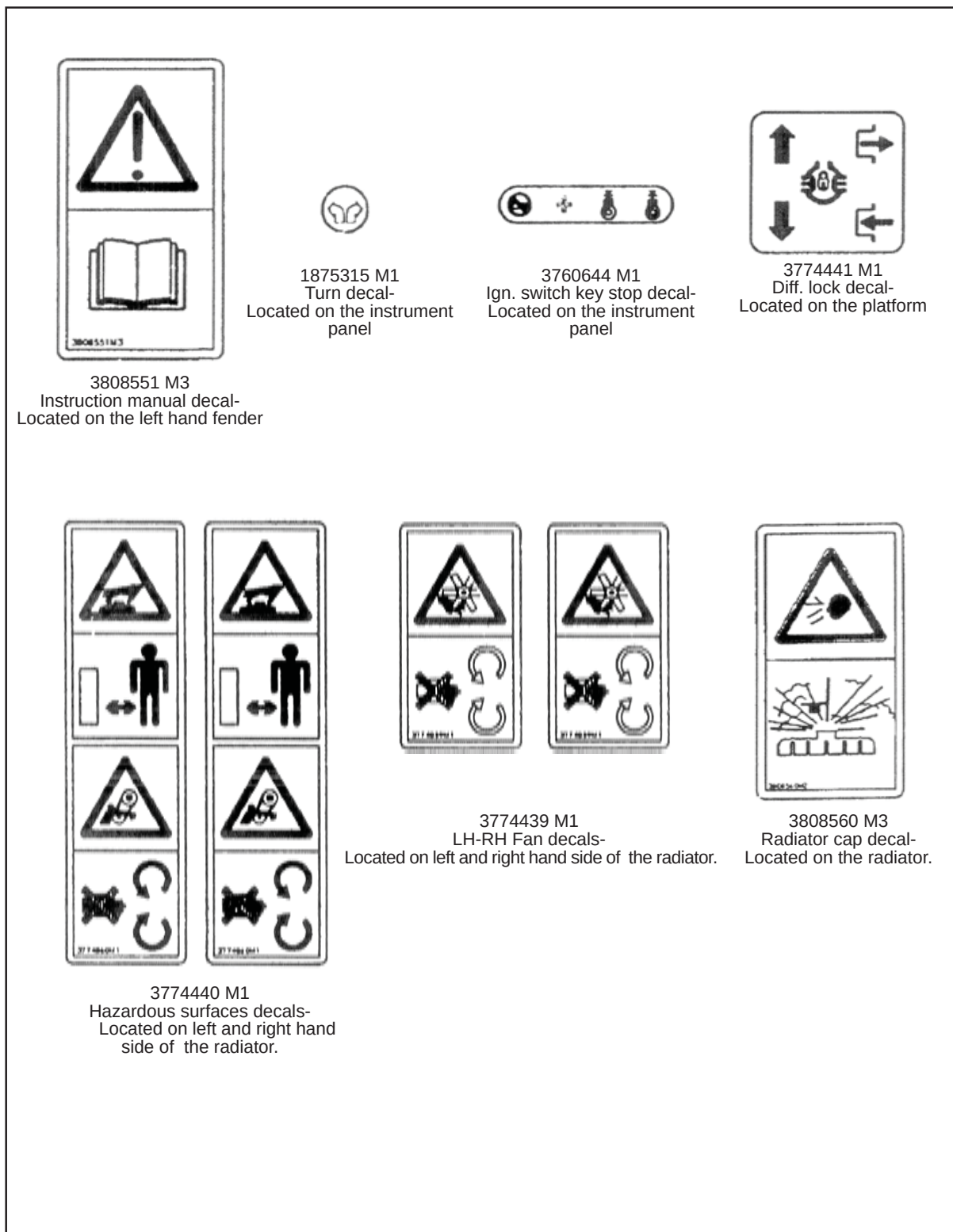


Fig. 23



## Safety Notes

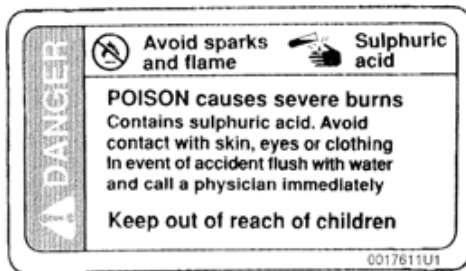
### Safety Decals and Locations



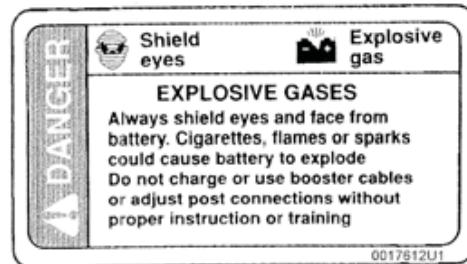
3808563 M4  
Starter warning decal-  
Located on the starter motor



3808557 M3  
Rear warning decal-  
Located on the rear right hand  
fender



0017611 U1  
Battery warning decal-  
Located on the battery.



0017612 U1  
Battery warning decal-  
Located on the battery

Fig. 24



## Safety Notes

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# Controls and Instruments

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| Controls - General -----   | 30   |
| Grammer Seat -----         | 31   |
| Cab Controls -----         | 34   |

# Controls and Instruments

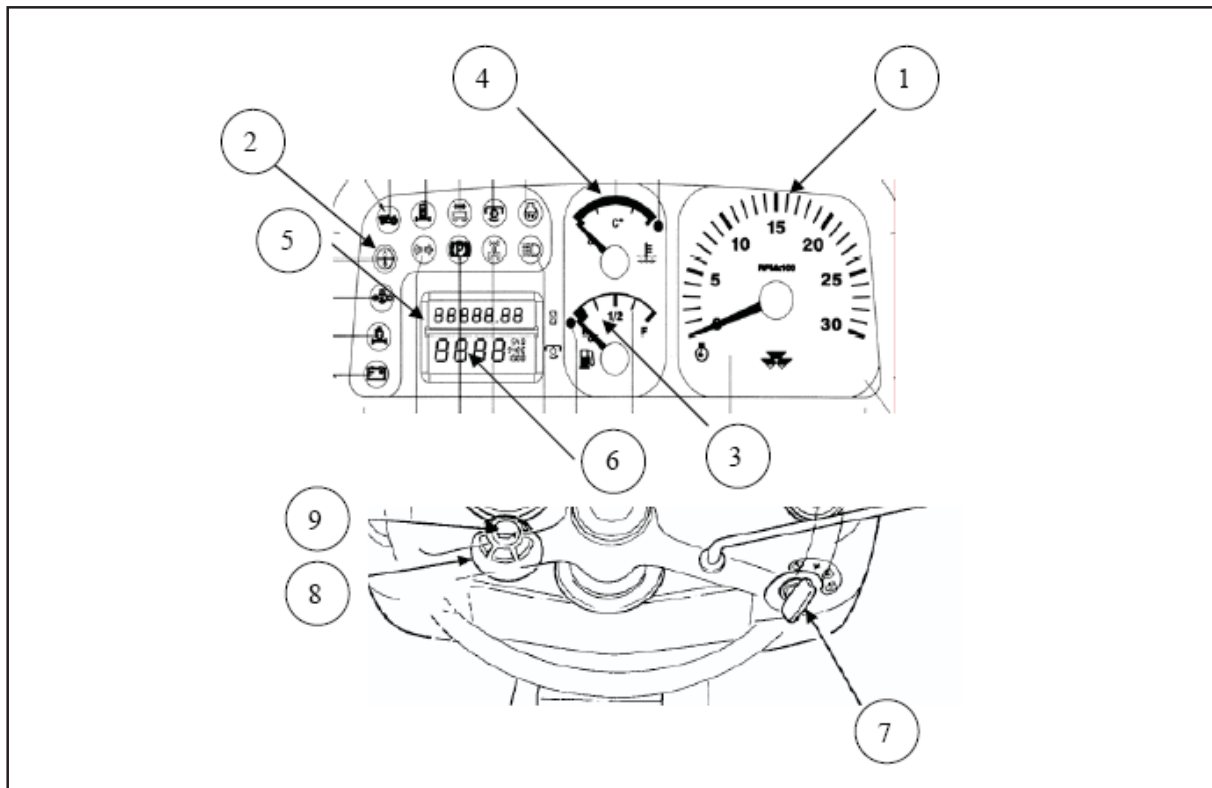


Fig. 25

## Instruments

A brief explanation of the instruments is given below.

### 1. Tachometer

This shows engine speed in rpm.

### 2. Indicator light panel

For details (2, Fig. 25 & Fig. 28).

### 3. Fuel gauge

This shows the amount of fuel in the tank. When the pointer enters the red area there is approximately 6 liter left in the tank when the tractor is on level ground.

### 4. Temperature gauge

This shows the temperature of the coolant in the engine. If the pointer moves into the red area, stop the engine and investigate the cause. Check the coolant level when cool. Check the radiator core for blockage, (see Maintenance section). Check the fan belt tension. Rectify any fault found.

### 5. Hourmeter-Digital

This digital hour counter registers one unit for every hour worked at approximately 1500 rpm.

### 6. PTO Speedmeter-Digital

This shows PTO speed in rpm.

### 7. Starter switch

**IMPORTANT:** Always turn the starter switch to the OFF position when the tractor engine has stopped. Leaving the starter switch in the Auxiliary / Run position may overheat the indicator light panel and discharge the battery.

The starter switch has four positions - (Fig. 26):

1. **Off.** Turn the key to this position to stop the engine.
2. **Auxiliary / run.** This position permits the electrical services to be switched on without the engine running. Switch returns to this position after engine starting.
3. **Pre-heat.** Moving the key to the pre-heat position

energizes the glow plugs for cold weather starting.  
**4. Start.** Moving the key to the start position supplies power to the starter motor and maintains power supply to the glow plugs. Spring loaded back to the second position.

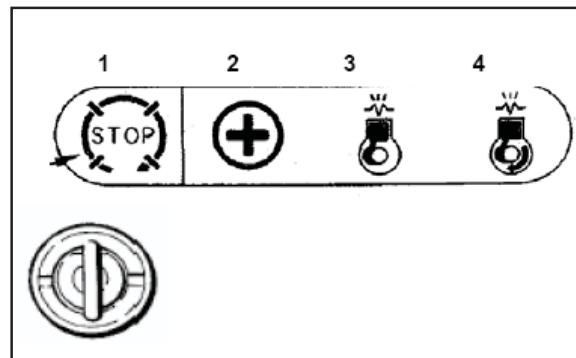


Fig. 26

## Controls and Instruments

### 8. Light switch

The light switch (Fig. 27) has four positions and is operated by turning it in a clockwise direction. The positions are:

0. Off.
1. Panel illumination, rear parking lights, rear work light feed.
2. Low beams additionally position 1.
3. High beams additionally position 1.

### 9. Horn push

To sound the horn, press the light switch (Fig.27).

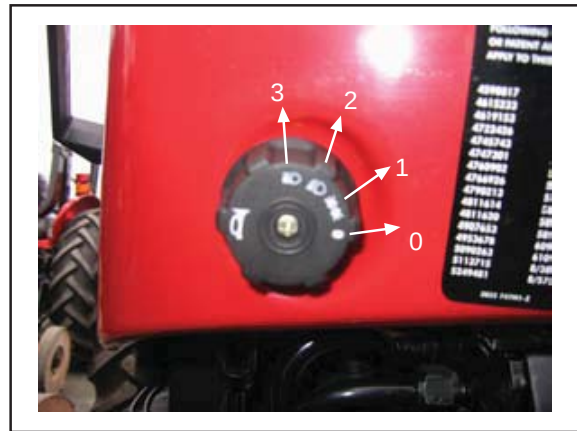


Fig. 27

### 10. Turn Indicator Switch

The switch combines the following functions, see Fig. 27A

1. Left hand turn indicator
2. Right hand turn indicator

When the turn indicators are used the appropriate green arrow on the instrument panel and also on the switch will flash in unison.

The turn indicator switch is NOT self-cancelling. The driver must remember to cancel after completing the maneuver. Direction indicator switch can only be used when the hazard warning lights are on.

### 11. Flashing Warning Lights Switch

When the flashing warning light switch is used (Fig. 27A) , all the turn indicators will flash in unison and the switch will flash a red triangle.

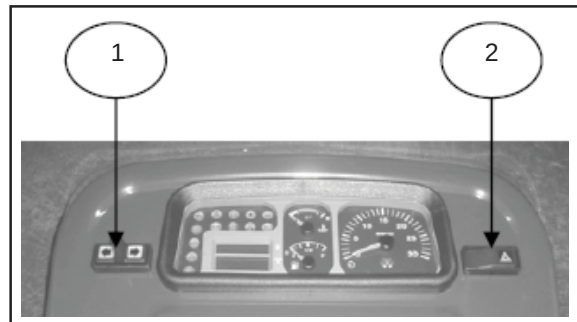


Fig. 27A

## Controls and Instruments

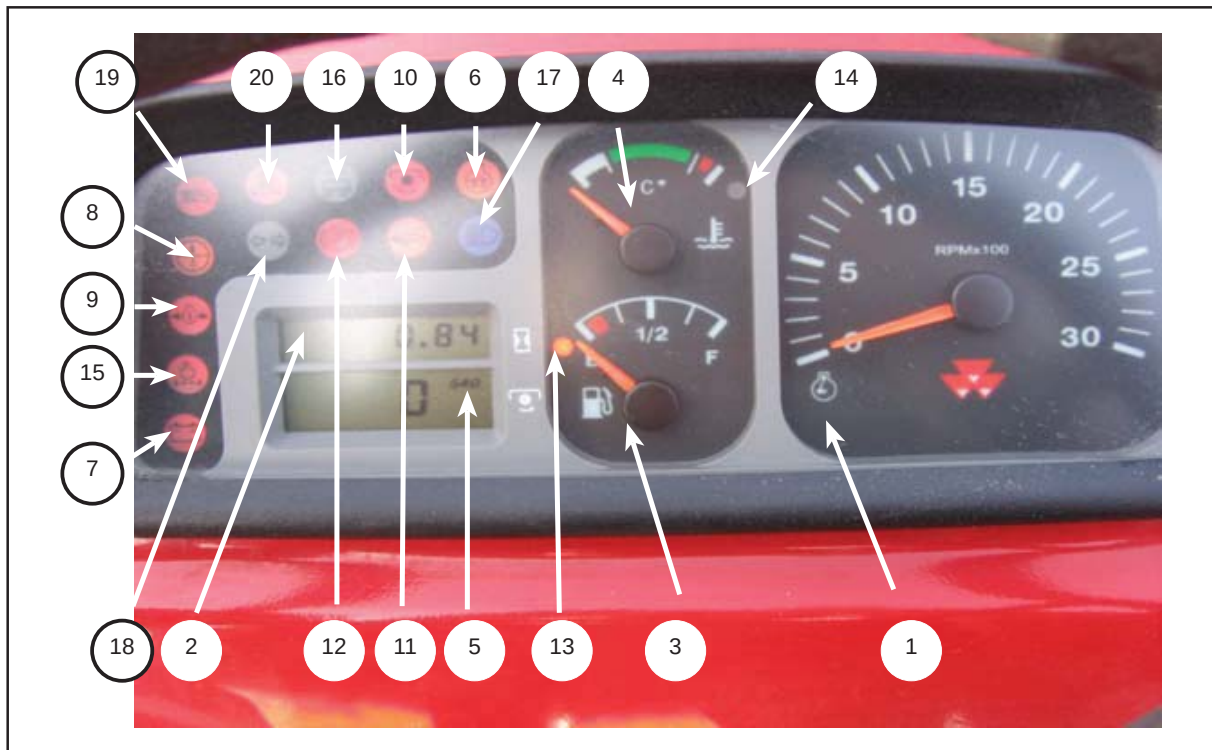


Fig. 28

- |     |                           |     |                                   |
|-----|---------------------------|-----|-----------------------------------|
| 1.  | Tachometer x 100          | 11. | 4 WD light                        |
| 2.  | Hourmeter                 | 12. | Hand brake light                  |
| 3.  | Fuel gauge                | 13. | Low fuel light                    |
| 4.  | Temp. gauge               | 14. | High temp. light                  |
| 5.  | PTO speed indicator       | 15. | Air filter light                  |
| 6.  | Glow plug light           | 16. | Trailer direction indicator light |
| 7.  | Alternator charge light   | 17. | High beam light                   |
| 8.  | Gear box oil filter light | 18. | Tractor direction indicator light |
| 9.  | Engine oil pressure light | 19. | Not used                          |
| 10. | PTO is on light           | 20. | Steering oil filter light         |

### Indicator lights

A brief explanation of the indicator lights (Fig. 28) is given below.

#### Alternator charge light

This red light (7) comes on when the engine starts and the starter switch key returns to the 'auxiliary/run' position. The light will go out with the increase in engine speed. The light will come on if the starter switch key is moved to the 'OFF' position when the engine is running, and will come on briefly as the engine stops.

If the light comes on when the engine is running, stop the engine and investigate the fault immediately. This indicates that the alternator is not charging. Check the alternator/fan belt tension, (see Maintenance section).

#### Engine oil pressure light

This red light (9) comes on when the starter switch key is turned to the auxiliary/run position. The light goes out when the engine starts. If the light comes on with the engine running, stop the engine and investigate the fault immediately. Check the engine oil level. If the light still comes on contact your Massey Ferguson Dealer to correct the fault.

#### Oil filter/ Dry air filter light

This red light (8 & 15) comes on when the hydraulic oil filter or the dry type air filter needs servicing. If the light comes on with the engine running, stop the engine and investigate the fault immediately. Check the air filter element for blockage and change if necessary, (see Maintenance section).

#### Headlight main beam light

This blue light (17) comes on when the headlight is switched to high beam.

## Controls and Instruments

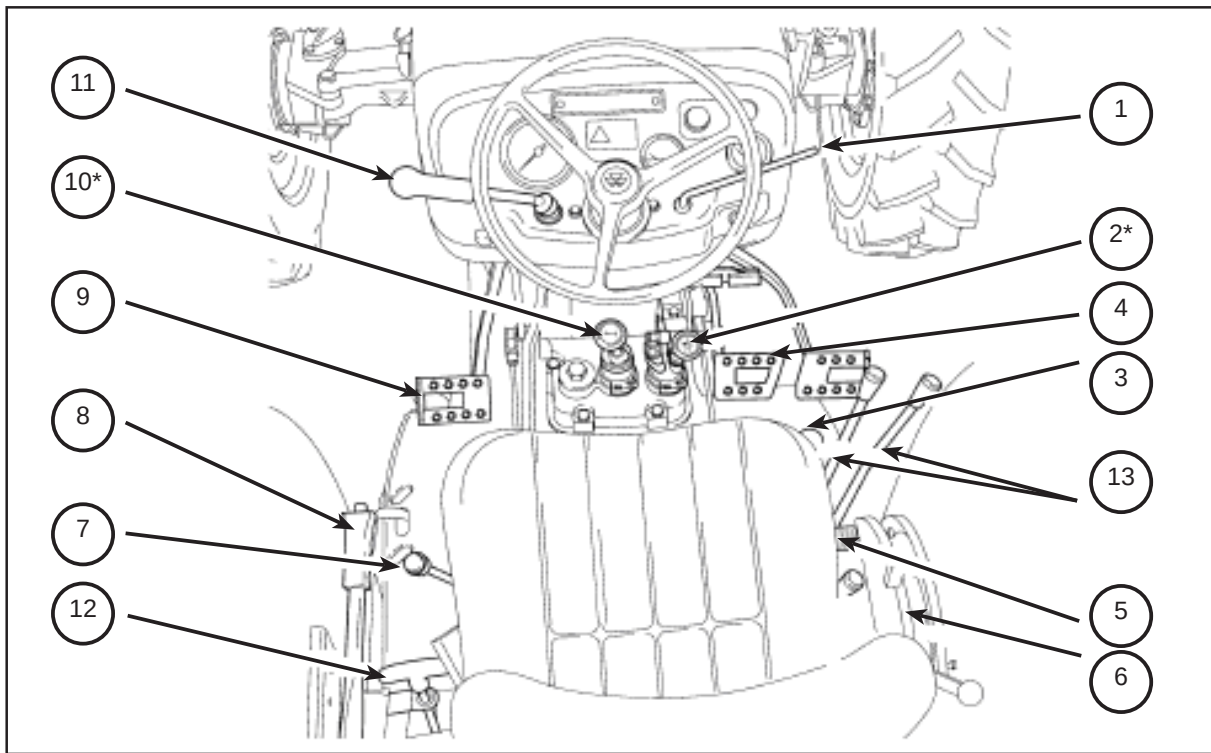


Fig. 29

### Controls - Operating

A brief explanation of the operating controls (Fig. 29) is given below:

#### 1. Hand throttle control lever

Move the lever down progressively to increase the engine speed.

#### 2. Dual range selector lever

The dual range selector lever is used to select high or low transmission range. The top of the gear lever knob is engraved L - H with a KEY or O symbol in between to indicate:

L - LOW

KEY or O SYMBOL - Neutral Start position.

KEY SYMBOL for non shuttle tractor - MF 410

O SYMBOL for shuttle tractor - MF 420/430

H - HIGH

For details of the dual range selector lever operation, (see Operation section).

**NOTE:** The dual range selector lever must be placed in the central (Neutral) position to engage the neutral start switch before the engine can be started. (only for MF 410)

\* : Dual selector lever and main gear lever on MF 430 tractor are located at the RH side of the platform. (Side-shift option).

For MF 420/430, shuttle lever must be placed in the central (Neutral) position to engage the neutral start switch before the engine can be started.

#### 3. Foot throttle



**WARNING:** When operating by foot throttle only, the hand throttle **MUST** be set at minimum (rotated up).

Operation of the foot throttle overrides the hand throttle setting when increasing engine speed. When the foot throttle is released the engine will return to the speed set by the hand throttle. For details of operation, (see Operation section).



## Controls and Instruments

### 4. Brake pedals



**WARNING: ALWAYS latch the pedals together when not being used for turning and close maneuvering. A rollover could result in personal injury.**

The foot brake system is mechanically operated. The two pedals (2, Fig. 30) can be used independently to aid turning in confined spaces or can be latched (1) together to provide a master pedal for normal braking. For independent brakes, disengage the latch. The inner pedal will then act on the left-hand wheel and the outer pedal will act on the right-hand wheel. For details of operation.

### 5. Differential lock pedal

The differential lock (2, Fig. 31) mechanically locks the rear axle shafts together so that both wheels turn together. This is an especially important aid when operating in muddy conditions as it provides increased traction and prevents needless tire wear. For details of operation.

### 6. Hydraulic control quadrant

These levers (1, Fig.31) control the action of the tractor linkage. For details of the hydraulic control quadrant operation see Operation section.

### 7. Power take-off control lever

To engage the live Power Take-off depress the clutch pedal fully and move the lever backwards (forwards on four wheel drive tractors with IPTO). To disengage the drive, depress the clutch pedal fully and move the lever to the central, neutral position. For details of operation see Operation section.

**NOTE:** Tractors are fitted with a neutral start switch that operates in conjunction with the Power Take-off lever: The Power Take-off lever must be placed in the neutral position to engage the switch before the engine can be started.

### 8. Parking brake lever

The parking brake acts on the tractor rear wheels. To engage the brake, press the footbrake pedals down and pull the hand lever up. To release the parking brake, press the footbrake pedals down then press the button on the end of the lever and push the lever down.

### 9. Clutch pedal

The clutch pedal travels through two stages. The initial movement - the extent of which is made apparent by a distinct increase in pedal pressure disengages the transmission drive. Additional downward movement disconnects the drive to the Power Take -off shaft. On tractors fitted with Independent Power Take-off (IPTO) the clutch pedal is single stage, engaging and disengaging the drive to the transmission only.

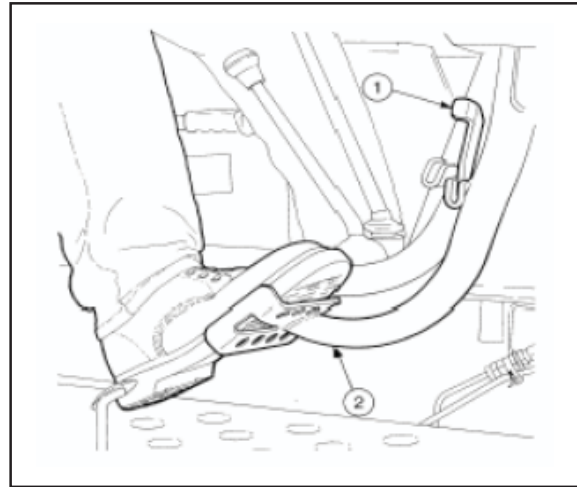


Fig. 30

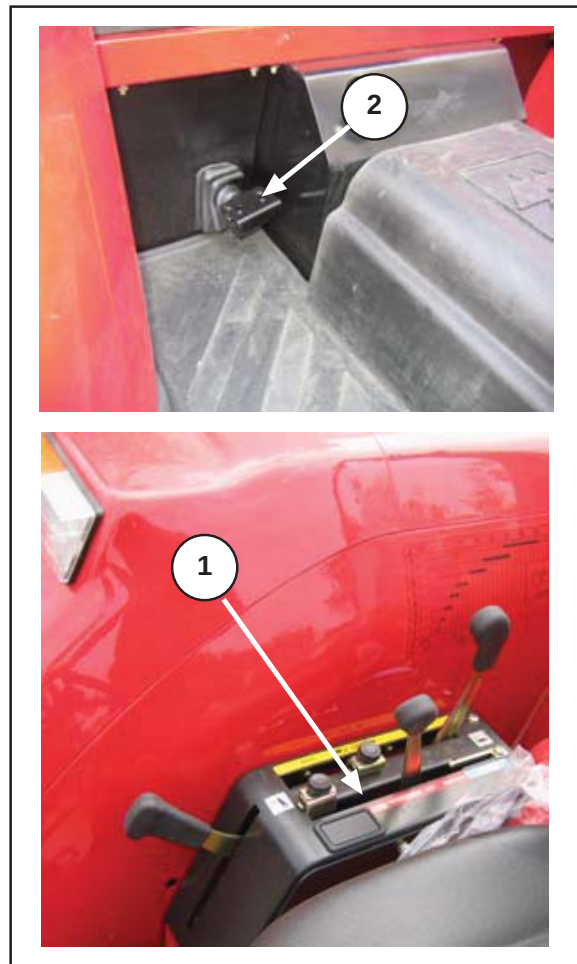


Fig. 31

## Controls and Instruments

### 10. Main gear lever

The gear lever knob has a diagram engraved on its top face to indicate the respective gear positions. On synchromesh gearboxes changes can be made on the move in the top two gears. The gear lever is used in conjunction with the range lever to select the required speed - also refer to the travel speed chart, and Operation section.

(Fig. 32) gives details of the gear shift patterns for the types of gearboxes that can be fitted as follows:

1. Eight-speed synchromesh gearbox
2. Eight-speed shuttle gearbox

### 11. Eight Speed Shuttle Forward/Reverse Lever

This lever (Fig.32A) is used on eight speed shuttle transmission to select the forward, neutral and reverse gears. (MF420/430)

Lift the lever "UP" to engage either forward or reverse gear. For details of operation, (see page 41).

**IMPORTANT:** The tractor *MUST* be stationary when shifting from forward to reverse or vice versa, otherwise serious damage could be caused to the transmission.

### 12. Four-wheel Drive Control Lever (if fitted)

This lever engages the four-wheel drive when pushed "DOWN". For details - (see page 41)

### 13. Control valve lever(s)

These levers control auxiliary hydraulic equipment (Fig. 33). For details of operation - (see page 48).

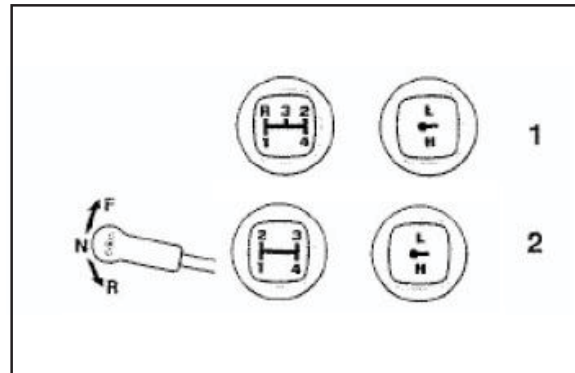


Fig. 32



Fig. 32A



Fig. 33

## Controls and Instruments

### Controls - General

A brief explanation of the general controls is given below:

#### Leveling lever

The right-hand lower link has a leveling lever (Fig. 34 and 35) which is operated by turning the cranked handle clockwise to lower the lower link or counter-clockwise to raise the lower link .



Fig. 34

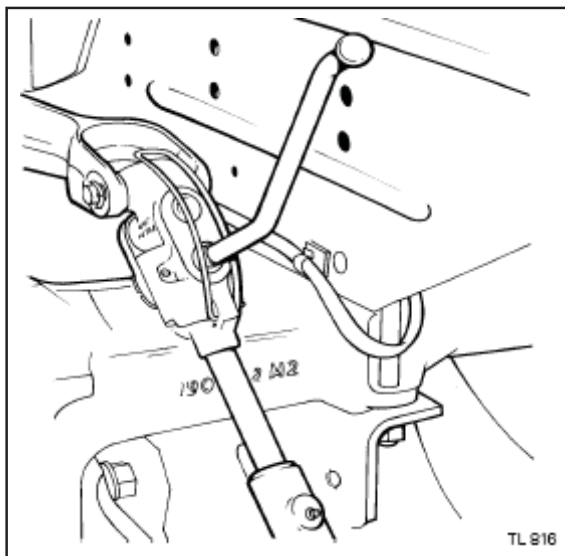


Fig. 35

#### Rear work light

The rear work light (Fig. 36) is operated by a sliding switch on the back of the light.

Rear work light can only be used when the parking lights are on.

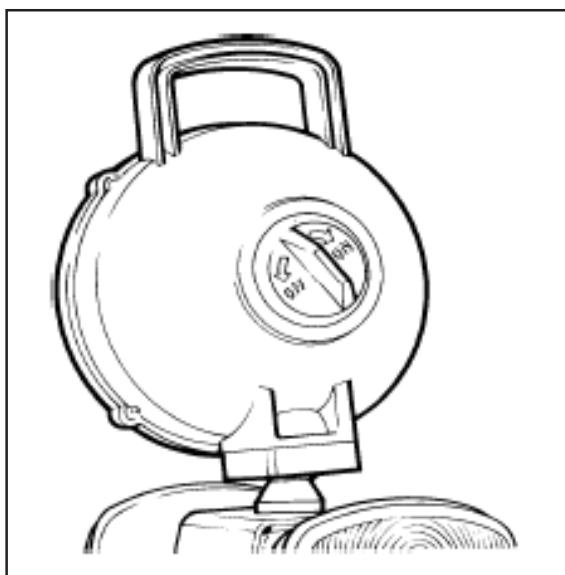


Fig. 36

## Controls and Instruments

### Grammer Seat



**WARNING: DO NOT adjust the seat when the tractor is in motion.**

To adjust the seat proceed as follows:

#### Weight adjustment:

For maximum comfort it is important that you set the suspension to suit your individual weight. Check the weight shown in the weight indicator (1, Fig. 37-38), it is calibrated in kilograms and pounds, It should be set to your body weight. If adjustment is required, climb up the tractor and seat, then unclip the handle (2) and rotate it clockwise to increase the weight, counter-clockwise to reduce the weight.

Test the seat suspension by alternately applying and releasing your full weight on the seat. If you require a softer or harder suspension, adjust the control accordingly.



Fig. 37

#### Forward and backward adjustment:

To adjust forward and backward movement of the seat, pull the lever (3) up to disengage the runner lock, then slide the seat either forward or backward as required. Release the lever so it locks into position.

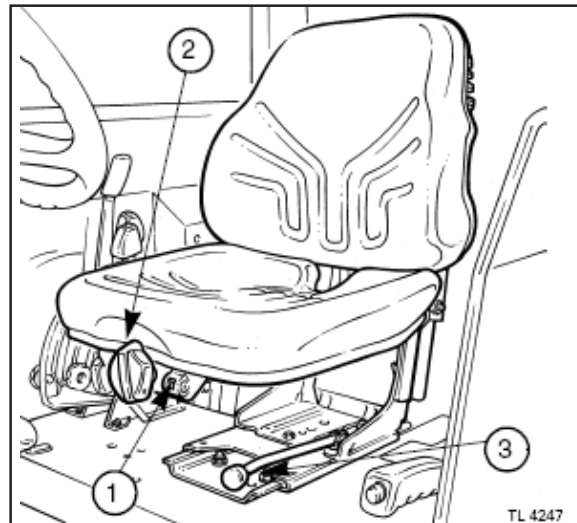


Fig. 38

## Controls and Instruments

### Height adjustment:

To adjust the seat for height, pull up the hand grip on the back of the seat (4. Fig. 39) and move the seat up or down as required. Allow the seat to lock into position.

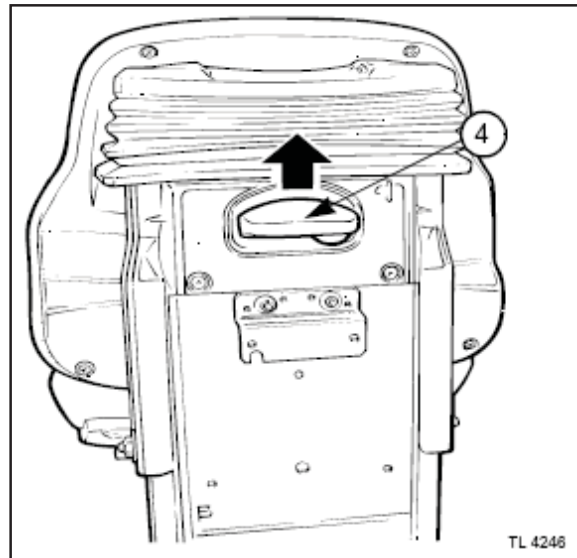


Fig. 39

### Seat belt

The seat belt (Fig. 40) is a simple lap type, it can only be effective if:

The seat is properly adjusted, the belt is not twisted or allowed to rub against any sharp edges, the buckle is securely fastened, the belt is correctly tensioned and there is no slack.

To fasten, pull the buckle (1) across the lap and push it into the lock (2). A click and upward movement of the lock release button (3) will indicate that the belt is locked.

To release, press the lock release button downwards. Adjust the belt by pulling the short end (4) of the webbing through the adjuster (5) until the belt is comfortably tight. Slide the end along the webbing to take up any slack after final adjustment.

When not in use, the seat belt should be stored on the clip provided to keep it from being damaged or becoming dirty.

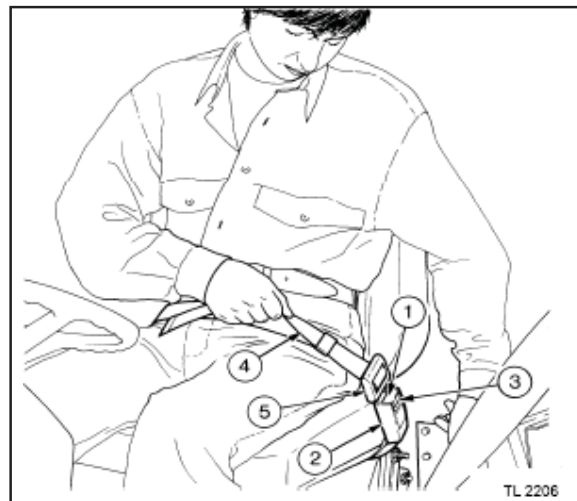


Fig. 40



## Controls and Instruments

### Slow moving vehicle sign

A mounting bracket is provided behind the seat above the hydraulic control valve for the mounting of the Slow Moving Vehicle (SMV) warning triangle (Fig.41). If the SMV sign is lost or in need of replacement, it can be obtained from your Massey Ferguson Dealer part number 3789 701 M1.

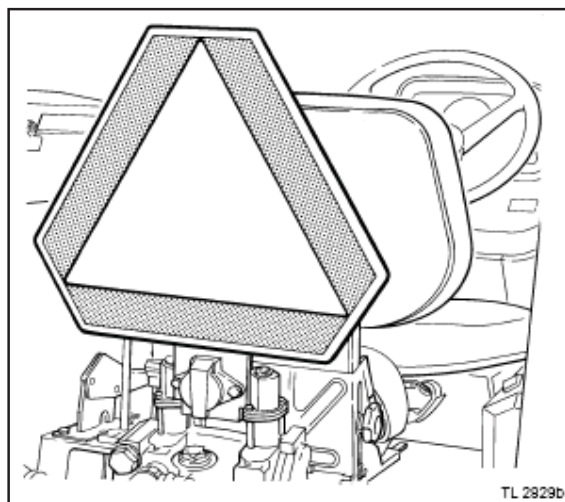


Fig. 41

### Tool box

A tool box (Fig. 42) is mounted on the right fender. It can be used for the storage of drawbar pins, lynch-pins and tools for the servicing of the tractor.



Fig. 42

### Trailer socket

This is a seven-pin socket (Fig. 43) for trailer electrical connections. Before using, ensure that the trailer plug is correctly wired up. (see page 97).

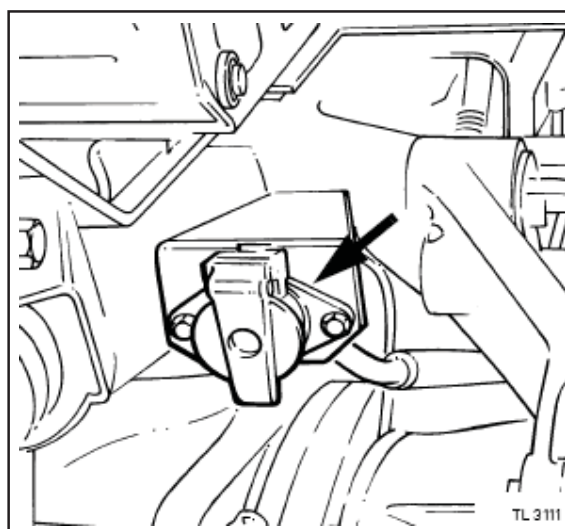


Fig. 43



## Controls and Instruments

### CONTROLS AND ACCESSORIES IN THE CAB (MF 420/430 Only)

#### Cab Roof (Fig. 43-a)

- 1- Control panel.
- 2- Air circulation vent.
- 3- Car radio
- 4- Roof lamps
- 5- Glove box

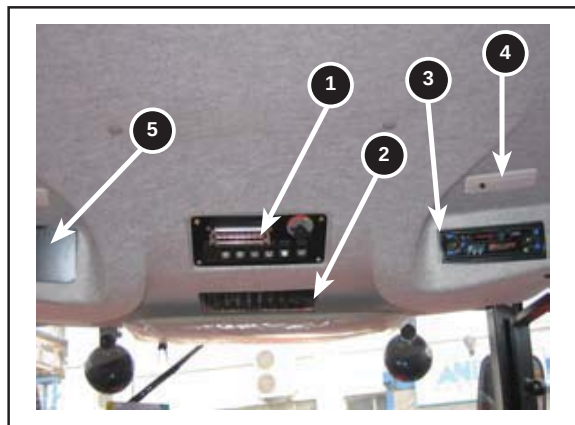


Fig. 43-a

#### Control panel (Fig. 43-b)

- 1- Fuse box for cab controls.
- 2- Adjustable ventilator/heater fan control knob.
- 3- Front work lights switch.
- 4- Rear work lights switch.
- 5- Windscreen washer switch.
- 6- Windscreen wiper switch.
- 7- Heater/ventilator fan switch.
- 8- Beacon lamp switch.

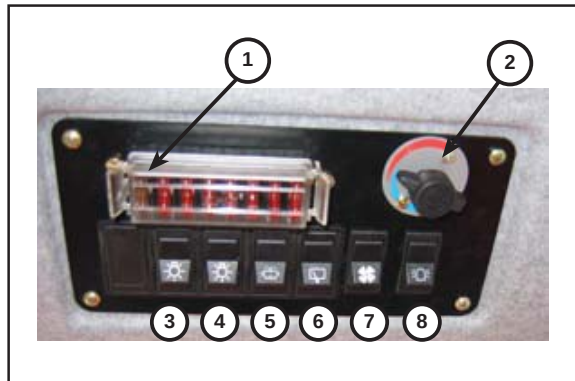


Fig. 43-b

#### Tool box (Fig. 43-c)

A tool box is located in front of the left-hand step.



Fig. 43-c

#### Windscreen washer reservoir (Fig. 43-d)

A reservoir is mounted on the right fender.



**WARNING:** The liquid level should be always checked before driving.



Fig. 43-d

# Operation

## Contents

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# Operation

## Starting and stopping the engine

Before starting



**DANGER: Carefully read and understand the SAFETY-STARTING section of this manual.**

**\*Always start and operate the engine in a well ventilated area.**

**\*If in an enclosed area, vent the exhaust to the outside.**

**\*DO NOT modify or tamper with the exhaust system.**

1. Carry out the Daily Maintenance as described in the Maintenance and Adjustment Section of this book.
2. Ensure that there is sufficient fuel in the tank.

### Neutral start switch check

Periodically check that the neutral start switches are functioning correctly. The procedure for this check is as follows:

1. Check that there are no bystanders around the tractor should it inadvertently start.
2. Depress the clutch and brake pedals. Attempt to start the tractor with the gears (shuttle lever if fitted) and PTO in neutral. The starter should operate.
3. Depress the clutch and brake pedals. Attempt to start the tractor with the gears (shuttle lever if fitted) engaged, and the PTO in neutral. The starter should NOT operate.
4. Depress the clutch and brake pedals. Attempt to start the tractor with the gears (shuttle lever if fitted) in neutral and the PTO engaged. The starter should NOT operate.

If either switch is not working correctly it must be replaced immediately.

## Normal starting - warm weather



**DANGER: DO NOT attempt to start the engine, other than from the driving position.**

1. Sit in the operator's seat and ensure that the parking brake is engaged.
2. To engage the neutral start switches, move all the gear shift levers (shuttle lever if fitted) and the PTO engagement lever to the NEUTRAL position. Then put all the auxiliary hydraulic control levers in their neutral positions, and move the hydraulic quadrant levers to the DOWN position.
3. Open the hand throttle halfway.
4. Turn the starter switch key fully clockwise to operate the starter. When the engine starts, allow the key to return to the auxiliary/run position.
5. Set the hand throttle to a fast idle position (approximately 1200 rpm) for two or three minutes, before putting the engine under heavy load.
6. If the engine does not start and run after using the normal starting procedure:
  - a. Check the fuel level in the fuel tank and check the condition of the battery.
  - b. Use the cold weather starting procedure.
  - c. Remove the air from the fuel system, using the procedure detailed in the Maintenance and Adjustment Section, (see page 68).
  - d. If the engine still fails to start, contact your Massey Ferguson Dealer for assistance.

## Normal starting - cold weather (Glow plugs)



**WARNING:** On tractors with hydrostatic steering full power steering is not immediately available when the tractor is started in very cold conditions, below 0°C (32°F). In these conditions allow the tractor engine to run for three minutes before driving the tractor.



**CAUTION:** DO NOT use aerosol types of starting aids such as ether. Such use could result in an explosion and personal injury. The engine is equipped with glow plugs cold weather starting aid.

Use the glow plugs, particularly in temperatures below 0°C (32°F).

**NOTICE:** Do not operate the glow plugs for more than 60 seconds at one time. Damage to the glow plugs could occur.

Starting procedure is as follows:

1. Ensure that the parking brake is engaged.
2. To engage the neutral start switches, move all the gear shift levers and the PTO engagement shift lever to the NEUTRAL position. Then put all the auxiliary hydraulic control levers in their neutral positions. Move the hydraulic quadrant levers to the DOWN position.
3. The governor control needs to be in the LOW IDLE position if the temperature is below 0°C (32°F)
4. Turn the starter switch to the third position clockwise (pre-heat) and hold it there for 6 seconds until the glow plug indicator light illuminates. This will activate the glow plugs and aid in the starting of the engine.
5. While the glow plug indicator light is illuminated, depress the clutch pedal and turn the key to the fourth position clockwise (start) to engage the starter.
6. When the engine starts, release the engine start switch key
7. If the engine fails to start within 15 seconds, return the key to the (pre-heat) position for a further seconds.

**IMPORTANT:** If the engine fails to start, ensure that the starter motor pinion is at rest before re-engaging the starter motor. Damage to the starter motor could occur.

8. Re-engage the starter by moving the key to the (start) position.
9. When the engine starts, allow the engine to idle for three to five minutes, or allow the engine to idle until the water temperature indicator begins to rise. The engine should run at low idle smoothly until speed is gradually increased to high idle. Allow the white smoke to disperse before proceeding with normal operation.

# Operation

## Starting the tractor with jump leads



**DANGER:** Operate the starter motor only from the operator's seat. If the key-switch is bypassed the engine may be started inadvertently with the transmission in gear.



**CAUTION:** Wear eye protection when charging the battery or starting the engine with a slave battery.

If the tractor has a discharged battery, (A, Fig. 44) it can be started with either a slave battery (B) or the battery of another vehicle. Follow the procedure described below.

1. DO NOT use a slave battery of more than 12 volts.
2. DO NOT connect across the terminals on the starter motor.
3. Access the battery in front of the radiator.
4. Connect one end of one jump lead to the slave battery positive (+) terminal (1) and the other to the tractor battery positive (+) terminal (2).
5. Connect one end of the other jump lead to the slave battery negative (-) terminal (3) and the other end to the tractor engine block (4).
6. Follow the starting procedure previously described.

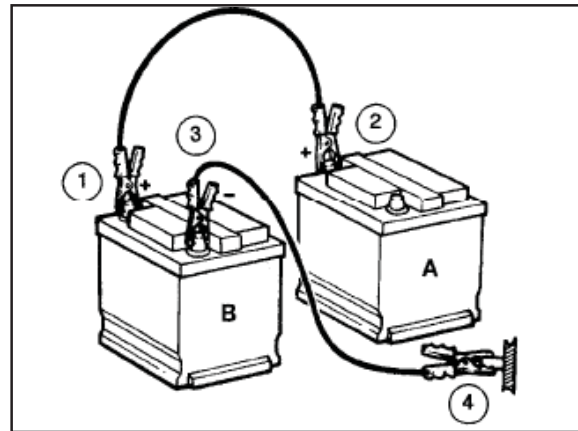


Fig. 44

## Towing to start the engine

If the tractor has a discharged battery, it is not possible to start the engine by towing.

**NOTE:** The battery must have sufficient charge to overcome the engine stop solenoid.

## Stopping the engine

1. Close the throttle and apply the parking brake.
2. Put the gearshift levers in NEUTRAL.
3. Ensure that the PTO engagement lever is in the DISENGAGED position.
4. Lower the hydraulic equipment to the ground.
5. Turn the key to the STOP position, and the engine will stop.

## Emergency stop

In the event of a failure or the need to shut the engine Down, turn the ignition switch OFF first. Then if the engine does not stop disconnect the cable plug from the solenoid on the injection pump (Fig. 45).

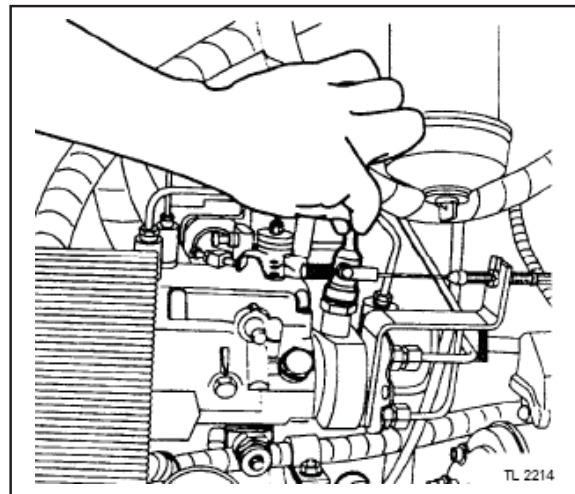


Fig. 45

# Operation

## Running-in

A gradual running in of a new engine is not necessary. Prolonged operation with light loads during the early life of the engine is not recommended. **DO NOT** operate the engine at high speeds without a load. The following precautions should be taken during the running-in period:

1. Experience has shown that the first 50 hours of tractor operation have a significant effect on the performance and life of the engine. From new, the tractor should be engaged in work which will load the engine as near as possible to full working conditions.
2. Use low gear when pulling heavy loads.
3. During the running-in period, check frequently the tightness of all screws, bolts, nuts, etc.
4. To ensure proper clutch life, care must be taken to bed-in the friction plates properly. During the first 50 hours a careful watch must be kept on the clutch pedal free travel, which should be adjusted as soon as the pedal travel decreases.

## Use of the travel speed chart

A typical travel speed chart is illustrated in (Fig. 46&47). The following instructions should be applied to the chart on the instrument panel or fixed to the tractor. Used in conjunction with the tachometer, the travel speed chart performs two basic functions:

1. Checking the tractor ground speed when traveling in a speed limited area.
2. Establishing the correct gear and engine speed at which to operate in order to comply with the requirements of certain PTO driven implements, e.g. spinner broadcasters or sprayers, etc.

## To read the travel speed chart:

1. The bold horizontal bars on the chart represent the ground speed range in each gear, between the two engine speeds given in the inset below the tractor.
2. The small inverted arrow in the horizontal bar indicates the point within each ground speed range at which the PTO shaft will be operating at 540 rpm (engine set at 1685 rpm). This can be related to the road speed in kph or mph at the top and bottom of the chart.
3. The numbers on the left of the chart are the gear ranges, 1st to 4th in the low range, 5th to 8th in the high range.
4. The information in the box gives the engine operating speed range, in this example, 1500 to 2250 rpm. The 540 pto engine speed is 1685 rpm for Live PTO. If the tractor has IPTO, the engine speed is 1789 rpm for the 540 pto speed.
5. Example of use:  
Require 540 PTO speed at 8 kph (5 mph) road speed.  
Set engine speed to 1685 rpm, on the chart select the horizontal bar where the small inverted arrow is opposite, or close to the 8 kph (5 mph) road speed, in this case it is the bar for 5th gear.

**NOTE:** Refer to the speed chart on your tractor for the correct gear and speed range.

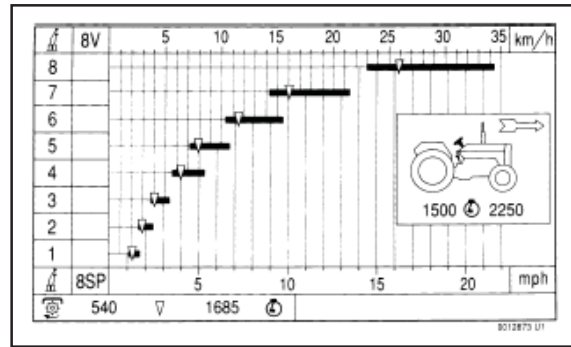


Fig. 46

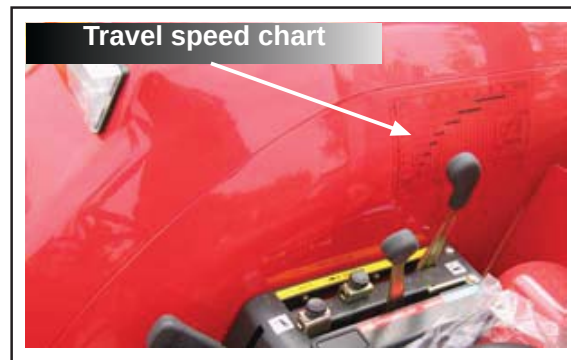


Fig. 47



# Operation

## Operating the tractor



**WARNING:** Before operating the tractor, familiarize yourself with the function of the brakes, clutch, transmission, PTO, differential lock and engine stop control. Towing



**CAUTION:** When the engine is stopped, hydraulic power assistance to the steering does not operate. The tractor can be steered manually. In this situation the tractor must be moved slowly, with caution, DO NOT exceed 3 kph. Before towing the tractor, move the PTO lever, and all gear levers into neutral. The towing speed must not exceed 3 kph.

### Driving in deep water

If the tractor is operating in water 50 mm (2 in) or less below the underside of the gearbox corrosion damage can occur to major components. See your Massey Ferguson Dealer for special water-proofing instructions, otherwise the Warranty may be invalidated.

### Having started the engine

**WARNING:** On tractors fitted with an eight speed shuttle gearbox, before engaging the main gear lever check that the forward/reverse lever is in the central (neutral) position.

\*Beware of bystanders in the area especially when reversing.

### General operating advice

**WARNING:** Travel speed should be such that complete control and machine stability is maintained at all times. Where possible, avoid operating near ditches, embankments and holes. Reduce speed when turning, crossing slopes, and on rough, slippery or muddy surfaces.

The following operating advice is important, particularly when using a front end loader and a shuttle transmission, if you do not heed this advice it will affect the life of the main clutch:

1. DO NOT rest your foot on the clutch pedal.
2. DO NOT use the clutch as a brake.
3. DO NOT work the tractor by slipping the clutch, this can result in over heating.
4. DO NOT use the clutch to hold the tractor on hills.
5. DO NOT use too high a gear.
6. DO NOT engage the clutch at high engine speed.
7. DO NOT coast down slopes with the tractor in gear and the clutch disengaged, or with the transmission in neutral.
8. The tractor MUST come to a stop before changing direction.

## Hand and foot throttle



**WARNING:** For road work, close the hand throttle and only use the foot throttle.

Operation of the foot throttle overrides the hand throttle setting when increasing engine speed. When the foot throttle is released, the engine will return to the speed set by the hand throttle. When using the foot throttle, the hand throttle must be fully closed.

1. Use the hand throttle to control the tractor speed when working in the field.
2. Never work the tractor by slipping and re-engaging the clutch, and at all times avoid riding the clutch pedal, which can cause overheating and lead to total clutch failure.
3. The use of flotation aids such as cage wheels or strakes, particularly in low gear, must be avoided.
4. DO NOT move either the gear lever (except synchromesh) or the dual range selector lever when the tractor is moving.
5. Never coast down slopes with the tractor in gear and the clutch disengaged, or with the transmission in neutral.

### Clutch pedal operation

The clutch release systems have a very light actuation to benefit the operator. Operators must NOT rest their foot on the pedal as clutch slip is soon induced. The clutch pedal is used to temporarily disengage the drive. The operator must use the clutch pedal as follows:

1. When starting the engine in cold weather.
2. To start the tractor moving from stationary.
3. To select DIRECTION.
4. To engage the PTO (standard PTO only).

**IMPORTANT:** DO NOT ride the clutch pedal when the transmission is under load. Release the clutch pedal completely for improved clutch service life. Always push the pedal down to disengage the transmission when making a quick stop.

### Selecting the correct gear

Select the gear which will give the best fuel consumption without overloading the engine or transmission. Also remember that ground conditions in the same field may vary almost every few meters, therefore, select the gear in which the engine will operate satisfactorily at just three-quarters maximum power.

The dual range selector lever, (2, Fig. 48) provides the working and transport ranges for the tractor as follows:

H - High - Transport range.

Key symbol - Neutral - Start.

L - Low - Work range.

#### 8 x 2 Syncromesh Gearbox - 410

The main gear lever (1, Fig. 48) provides the operating gears within the range selected. The range lever on the right (2) selects the range, forwards for LOW (L) and backwards for HIGH (H) range.

#### 8 x 8 Shuttle Gearbox - 420/430

The main gear lever (1, Fig. 49) provides the operating gears within the range selected. The range lever on the right (2) selects the range, forwards for LOW (L) and backwards for HIGH (H) range.

The shuttle lever (3) is used to change quickly between forwards and reverse. It has syncromesh on 3rd and 4th and the forward reverse shuttle

**NOTE:** The tractor must be stationary when changing gear.

### Four-wheel drive (if fitted)



**WARNING:** tractors equipped with four-wheel drive have increased traction and can climb steeper slopes. Keep off slopes too steep for safe operation. To prevent rear overturns, reverse up the steeper slopes.

**IMPORTANT:** DO NOT operate the tractor in four wheel drive while on the road, as this leads to premature front tire wear and excessive fuel consumption.

Four-wheel drive transmission greatly improves traction and braking in all field conditions. The drive to the front wheels is designed to be engaged or disengaged with the tractor stationary or moving. The tractor is equipped with a mechanical type of engagement which can be engaged or disengaged on the move. Anticipate the need for four-wheel drive and make sure that neither rear wheel is slipping then engage or disengage when the tractor is moving slowly. To engaged the four-wheel drive (Fig. 50) push the control knob DOWN. A green light on the instrument panel will indicate engagement. To disengage pull the control knob UP.

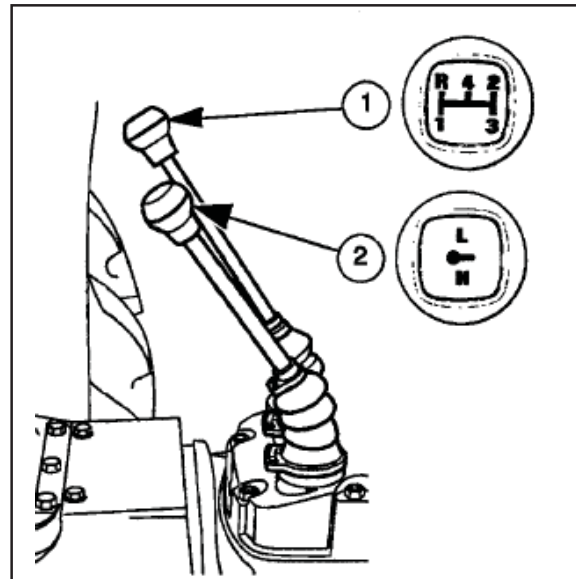


Fig. 48

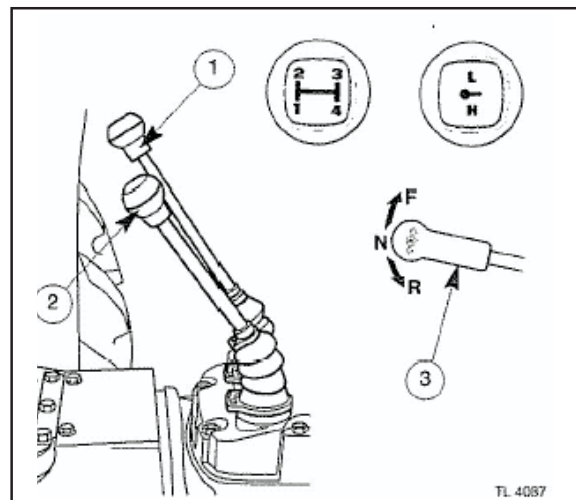


Fig. 49

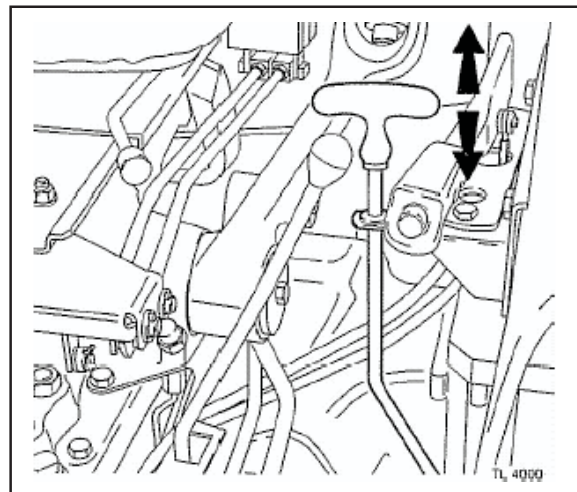


Fig. 50

# Operation

## Brakes



**WARNING:** The brake pedals must always be locked together to ensure uniform brake application and maximum stopping ability. Only unlock the brakes when making sharp turns. Sharp turns must only be made at slow speeds.



**CAUTION:** ALWAYS apply the parking brake when dismounting from the tractor.

1. When the tractor is being operated for stationary work, even if only for short periods, always engage the parking brake.
2. The independent brakes may be used to assist turning when traveling very slowly. Never apply one brake when turning at high speed.
3. A standard parking brake is fitted. Ensure that it is fully released before driving away.
4. When using the tractor on the road, lock your brake pedals together using the latch.

### Making sharp turns

1. Release the brake pedal latch, (1, Fig. 51)
2. Apply the brake (2) on the side to which the turn is to be made and turn the steering wheel.
3. Re-latch the brake pedals before driving on the road.

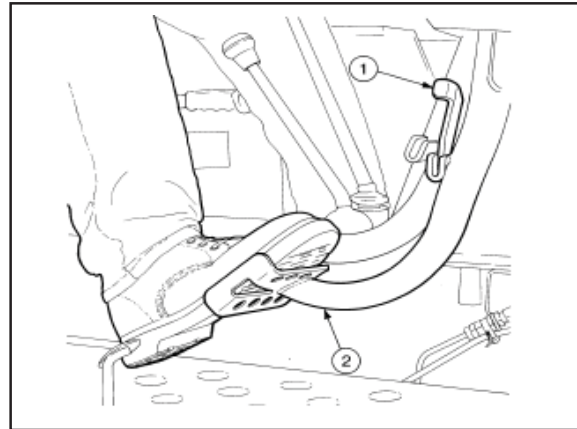


Fig. 51

## Differential lock



**CAUTION:** DO NOT drive on the roads, or at high speeds anywhere with the differential lock engaged. Steering will be difficult for field operation. Use the differential lock to improve traction, but release it for turning at row ends.

If a rear wheel starts to slip:

To engage the differential lock (Fig. 52):

1. Fully depress the clutch pedal.
  2. Push down on the differential lock pedal with your heel, this engages the differential lock.
  3. Release the clutch pedal slowly, while maintaining foot pressure on the differential lock pedal.
  4. To disengage the differential lock release the pedal.
- If the lock fails to disengage automatically, depress the clutch pedal.

**IMPORTANT:** DO NOT attempt to engage the differential lock with one wheel stopped and the other wheel spinning fast. DO NOT attempt to turn with the differential lock engaged.



Fig. 52

## Power take-off (PTO)



**WARNING:** PTO shafts and PTO driven implements can be extremely hazardous, observe the following important points:

- \*DO NOT operate the tractor without a PTO cap fitted when not using the PTO. It protects people from injury as well as the splines from damage.*
- \*Before attaching, adjusting or working on PTO driven implements, disengage the PTO, stop the engine and remove the key. DO NOT work under raised equipment.*
- \*Before engaging a PTO driven implement and after fitting, ALWAYS carefully raise and lower the implement using Position Control, and check clearances, PTO shaft slide range and articulation.*
- \*Ensure that the PTO safety shield is in place at all times.*
- \*Ensure that all PTO driven implements have the correct guards, are in good condition and conform to current standards.*
- \*NEVER step across any driveline.*
- \*DO NOT use the tractor drawbar or the implement drawbar as a step.*
- \*NEVER use the driveline as a step.*
- \*NEVER wear loose fitting clothes.*
- \*Keep at least your height away from a rotating drive line.*

There are two types of Power Take-Off (PTO) available, Direct Drive from the engine using a dual clutch and mechanical engagement (MF 410 only). The second type ( MF410/420/430 ) is an Independent Power Take -Off (IPTO) using a single split torque clutch and hydraulic engagement.

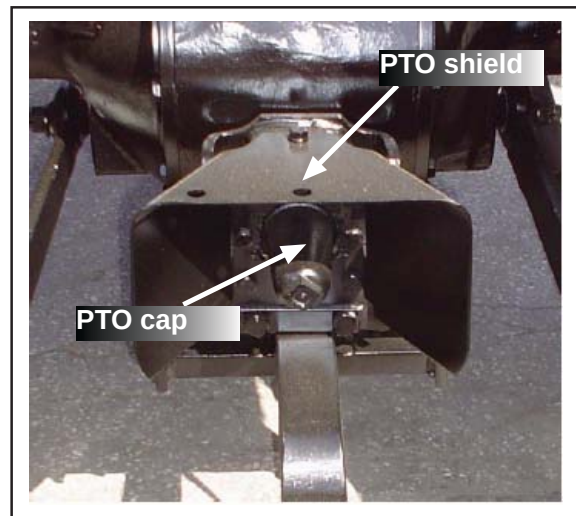


Fig. 53



# Operation

The PTO shaft, (1, Fig. 54) at the rear of the tractor has six splines and a diameter of 35 mm (1 3/8 in) with an annular groove for positive fixing of implement couplings. A removable cap (2) protects the splines and the operator when the shaft is not in use. Reinstall the PTO shaft cover (2, Fig. 54) when not in use.

## Live power take-off

The live PTO is engaged by using the dual clutch. Depressing the clutch pedal through the first stage disconnects the drive from the engine to the transmission without interrupting the operation of the PTO.

### To engage live PTO:

Depress the clutch pedal fully, move the engagement lever to the rear 'A'. Set the engine speed to 1685 rpm for 540 PTO shaft speed.

### To disengage live PTO:

Depress the clutch pedal fully, move the engagement lever forward to the vertical position 'B'.

## Independent power take-off (IPTO)

The Independent Power Take-off (IPTO) (Fig. 55) allows the operator to engage and disengage the PTO without using the engine clutch and independent of the transmission. When operating the engagement lever, **DO NOT** engage at engine speeds over 1600 rpm. Ensure that the IPTO clutch is either fully engaged, or fully disengaged. Partial engagement, or slow engagement can cause damage to the internal components.

### To engage IPTO:

Move the engagement lever back to position 'A'. Set the engine speed to 1789 rpm for 540 rpm PTO shaft speed.

### To disengage the IPTO:

Move the lever forward to the vertical position 'B'.

## Attaching to the PTO shaft

1. Unscrew and remove the PTO cap and store it in the tool box for future use.
2. Attach the PTO shaft to the splined shaft on the tractor. Ensure that the locking device has securely retained the shaft.
3. Ensure that all the guards are in place. A slot (1) is provided in the top of the PTO guard to enable the driveline shield to be bolted to the tractor when pulltype PTO driven equipment is being used. A hole (2) is also provided for the PTO driveline shield chain.
4. If PTO driven equipment is connected to the swinging drawbar, the drawbar must be set so that the horizontal distance 'A' between the end of the PTO shaft and the pin hole in the end of the drawbar is 356 mm, (14 in) if using the six spline 540 rev/min shaft.

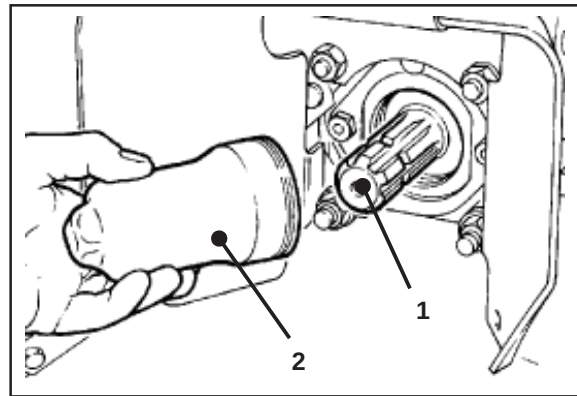


Fig. 54

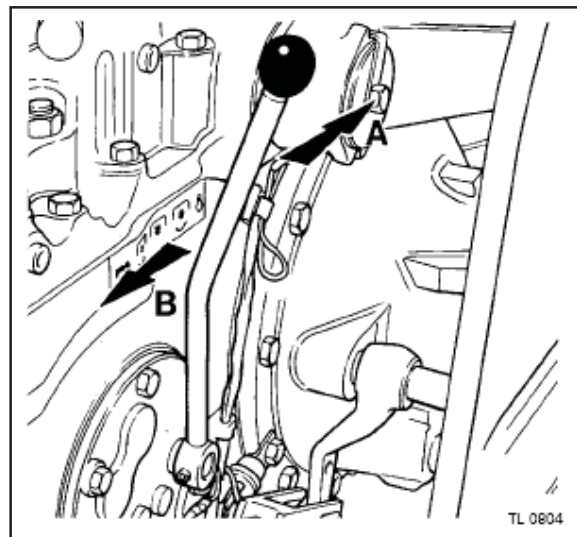


Fig. 55

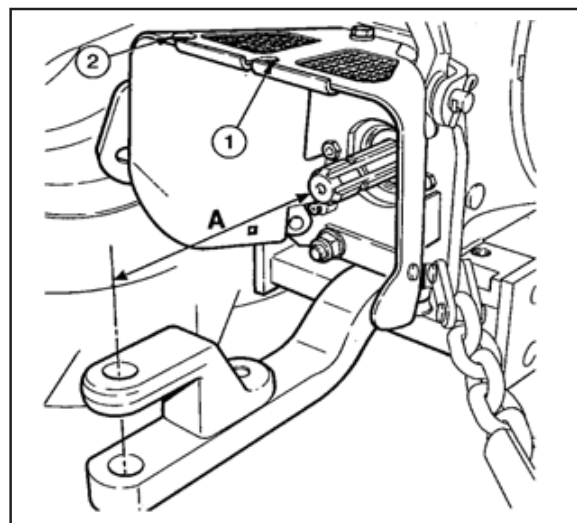


Fig. 56

### Creeper gearbox (optional for MF 410/420/430)

The creeper gearbox is located between the transmission and the rear axle housing. It gives the option of reducing the speed of the tractor in the ratio of 4:1, beside allowing the use of normal speeds. The creeper gearbox offers double the number of speeds in forward and reverse.

The operating lever, located in the middle of the gearbox cover permits engagement of the creeper gearbox or use of the normal transmission. The tractor must be stopped with the clutch fully depressed in order to move the lever.

Move the lever forward to the HARE position (Fig. 57) to the position where the creeper gearbox is disengaged and the tractor speeds are normal. Move the lever rearwards through neutral to the TORTOISE position for engagement of the creeper gearbox and the provision of very low speeds. Implements requiring the use of a creeper gearbox are those used for planting, transplanting and drainage operations.

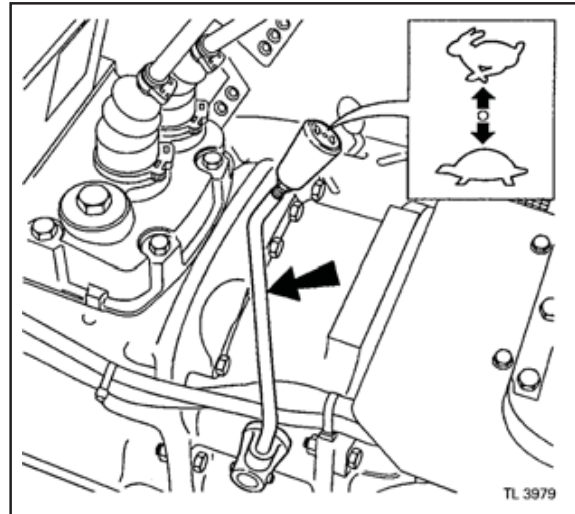


Fig. 57

### Hydraulic lift system



**WARNING:** Before operating any of the controls ensure that all bystanders are clear of the tractor and its implements.

The Ferguson hydraulic system combines the tractor and implement into one unit with the implement hydraulically controlled. This system has the following controls:

**Draft control**, (1, Fig. 58) operates in the Yellow (Draft) range of the quadrant and is used to control the working depth of soil-engaging implements. The further the lever is moved to the DOWN position, the deeper the implement will tend to penetrate the ground and, conversely, the nearer the lever is to the UP mark, the shallower the implement will tend to work.

**Position control**, (2) operates on the Red (Position and Transport) and Blue (Constant Pumping) range of the quadrant. The Red sector is used to control the working height of implements above the ground. When the lever is in the Blue sector, the tractor's lift pump hydraulic power can be used to operate a hydraulic tipping trailer, simple front end loader, low power hydraulic motor or auxiliary hydraulic control valve. It can also supplement the auxiliary system to give additional speed. The quadrant has a stop to prevent inadvertent location in constant pumping. Push the control lever slightly outward and then select the constant pumping position. Adjustable stops, hand knobs (3) lock the adjustable stop in place when the desired working depth or height is reached.

#### Response control

This control (Fig. 59, 1) is used to control the rate of drop of the lower links and the attached implement. Rotate the knob counterclockwise (-) for slow, and clockwise (+) for fast.

**NOTE:** The control is very sensitive, move slowly and a little at a time.

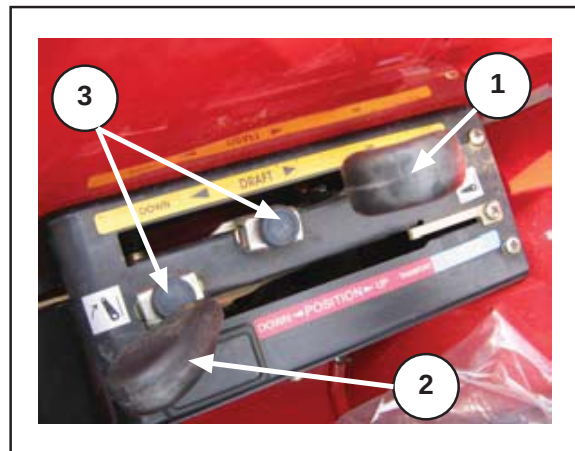


Fig. 58



Fig. 59



# Operation

## Draft control - outer lever - Yellow quadrant

### **Type of work:**

Plowing, subsoiling, heavy cultivation, soil engaging implements

### **Lever positions:**

Position Control (2, Fig. 60), fully up in TRANSPORT position.

Response Control, in the SLOW position. Operate the lift hydraulics using the Draft Control Lever (1).

### **Entering work:**

Move the Draft Control Lever to the DOWN position to lower the implement into work. The implement will start to penetrate as the tractor moves forward. The further the lever is moved to the DOWN position, the deeper the implement will tend to penetrate.

### **In work:**

When the desired working depth has been obtained, move the Adjustable Stop (3) back to the lever and lock into position with the hand knob. The Draft Control Lever can be moved slightly either side of the stop to adjust for varying soil conditions. Set the Response Control (Fig. 59) towards SLOW (-) but in a position to allow adequately fast entry into work. If the implement moves up and down erratically turn the Response Control towards SLOW.

### **Leaving work:**

On reaching the headland, raise the implement by moving the Draft Control Lever back to the UP position. Re-enter work by moving the Draft Control Lever forward to the Adjustable Stop.

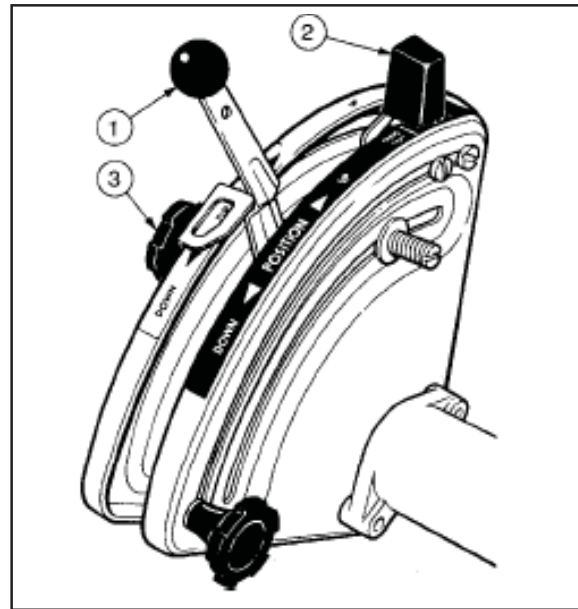


Fig. 60

## Position control - inner lever - Red sector

### **Type of work:**

Operation which requires the implement to be kept at a constant height above the ground, e.g., mowers, spinner broadcasters, levelling blades and other implements producing little or no draft.

### **Lever positions:**

Draft Control (1, Fig. 61), fully UP position. Response Control, (Fig. 59) in the SLOW position. Operate the hydraulics by using the Position Control Lever (2).

### **Starting work:**

Move the Position Control Lever (2) down until the required implement height above the ground is obtained. Set the Adjustable Stop (3) in line with the Position Control Lever. Set the Response Control towards SLOW but in a position to allow adequately fast entry into work.

### **In work:**

No further adjustment is necessary.

### **Leaving work:**

Move the Position Control Lever (2) up to the TRANSPORT position, if required. Re-enter work by moving the Position Control Lever forward to the Adjustable Stop.

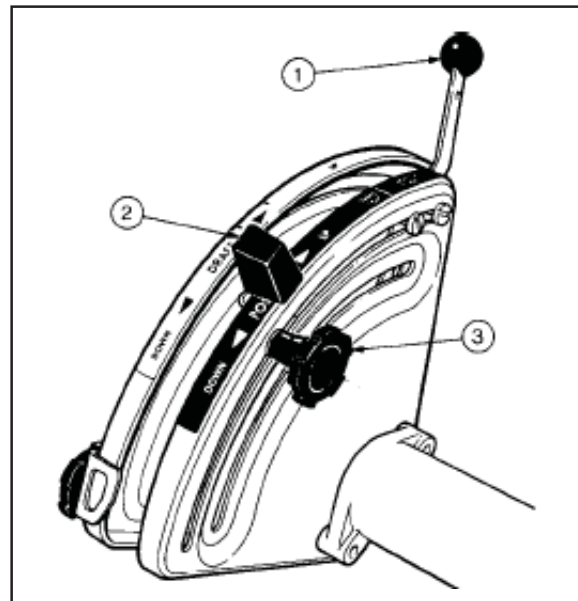


Fig. 61

# Operation

## Transport position

Used for transporting implements on the three-point hitch in the fully raised position.

### Lever positions:

Draft Control Lever, (1, Fig. 62) in the fully UP position. Position Control Lever (2), placed in the TRANSPORT position against the stop. This will lift the linkage and implement and hold in the raised position.

## Constant pumping - Blue sector

The constant pumping position provides a flow of hydraulic oil at 16,7 liter/min, controlled by the Draft Control lever. It can be used to perform the following functions:

- \*A single hydraulic quick release coupling at the rear of the tractor for tipping trailers.
- \*Simple front end loader with single acting operation worked off the rear quick release coupling.
- \*Low input hydraulic motors connected to the quick release coupling.
- \*Auxiliary hydraulic valve kit comprising of a selector valve to be installed on the lift cover, hydraulic control valve and quick release couplings: 0019019U91 Two spool kit complete.

Additional height for the lift arms to latch and unlatch an automatic trailer hitch.

## Auxiliary control valve (tractors with linkage pump only)

For operation of the auxiliary control valve the hydraulic lift controls must be set as follows:

### Lever positions:

Draft Control (1, Fig. 63), fully UP.

Move Position Control lever (2) to raise the links to the required height.

Selector Control (4), external position - lever backwards. This will automatically select CONSTANT PUMPING.

Move the Position Control lever (2) to the TRANSPORT position (Blue sector).

Response Control, not applicable.

### Operation:

Return the Selector Control lever (4) to the LINKAGE position - forwards - to operate the linkage.

## Auxiliary hydraulic valves

1. Carefully connect the implement hydraulic hoses to the tractor couplers.
2. Place the three-point hitch in the desired position.
3. Rotate the selector valve to the auxiliary position.
4. Set the Position Control lever to CONSTANT PUMPING.
5. Raise and lower the implement using fender mounted auxiliary valve.

### To resume three-point operation:

1. Move the position control lever out of constant pumping to DOWN.
2. Return selector valve to three-point hitch position.

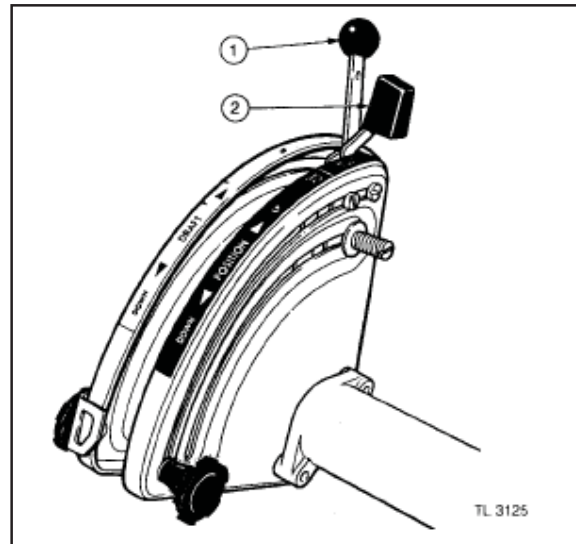


Fig. 62

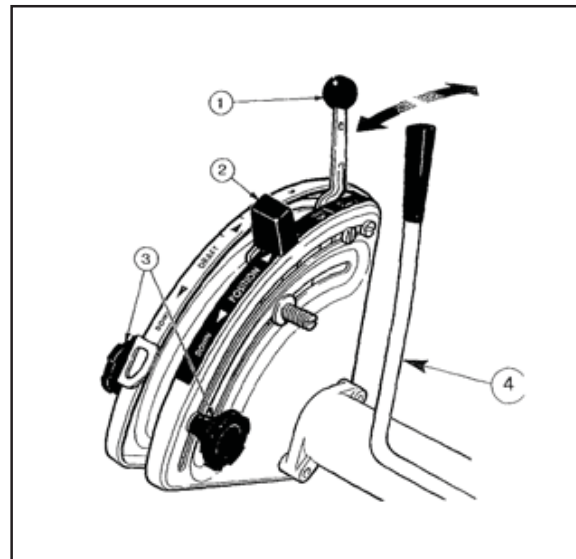


Fig. 63

# Operation

## Auxiliary control valve (if fitted)

The control valves and levers are located on the right-hand side of the seat (Fig. 64). The levers (1, 2) operate the control valves on the rear of the tractor. Each valve has a control spindle for the selection of single- or double-acting operation.

It is used on equipment requiring the use of hydraulic controls using single- or double-acting hydraulic rams and low input hydraulic motors.

Hydraulic self-sealing, quick-release, couplers are situated at the rear of the tractor (Fig. 65). Hydraulic hoses can be coupled or uncoupled, without any loss of oil. A decal is positioned near the quick-release couplers which shows the numbered connectors which correspond to the control lever movements. Before attaching the hoses be sure that the quick-release couplers and hose ends are clean and free from dirt.

To connect, push the implement hose connector into the quick-release coupler. To disconnect, with the engine stopped, relieve any pressure by operating the control levers through their entire range at least twice. Push the coupler slightly into the connector and then pull out quickly. The couplers will automatically uncouple and seal, preventing any loss of oil. After disconnecting, put protective covers (4, Fig. 65) on all hose connectors to prevent dirt getting in.

**NOTE:** If the implement accidentally becomes disconnected from the tractor the hoses will automatically uncouple, preventing damage to the hoses.

## Auxiliary hydraulic control valve sections

The tractor is normally fitted with two spring return valve section, they are spring loaded so they automatically return to the neutral position when released.

Each valve section, (Fig. 66) has a control spindle (3) at the base of the section for the selection of single- or double-acting cylinders. Screw IN for double acting cylinders, screw OUT for single acting cylinders.

### Operation - single-acting rams

To operate single-acting rams, screw the control spindle (3, Fig. 66) fully out, and use only the coupler marked (1, Fig. 65). Ensure that the implement hoses are correctly connected to the tractor couplers. Refer to the appropriate implement Operator Instruction Book.

To extend the ram, pull the lever back. To retract the ram, push the lever forwards.

### Operation - double-acting rams

To operate double-acting rams, screw the control spindle (3, Fig. 66) fully in, and attach the hose from the side of the ram which causes it to extend, to the coupler marked (1, Fig. 65) and the return hose to the coupler marked (2). To extend the ram, pull the lever back. To retract the ram, push the lever forwards.

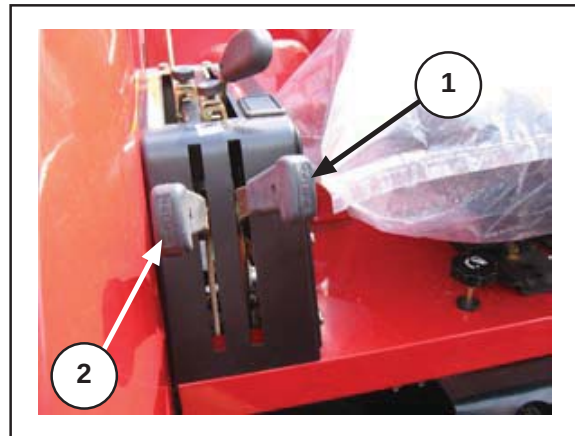


Fig. 64

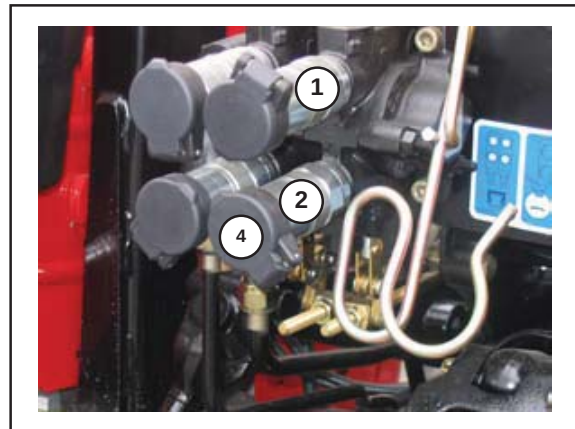


Fig. 65

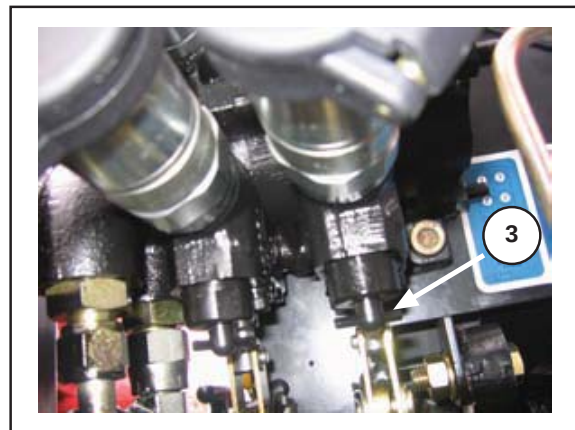


Fig. 66

## Operation - hydraulic motors

Although the standard valve section is not specifically designed for use with hydraulic motors, these valves can be used satisfactorily, if the following points are observed.

1. Always connect the motor feed to the coupler (1 or 2, Fig. 65).
2. NEVER connect the motor return to the quick-release couplers. Contact your Massey Ferguson Dealer when fitting a hydraulic motor to ensure that the hydraulic circuit is completely satisfactory and the return line is connected directly to the transmission case.

**NOTE:** A special control valve section is available for use with hydraulic motors. For details of this and other specialized control valves contact your Massey Ferguson Dealer.

When in use the linkage cannot be raised or lowered.

## Operating a front end loader

When operating a front end loader using the tractor auxiliary hydraulic control valve fitted with a detent system, great care must be taken to prevent the load rolling down the lift arms when fully raised. The detent system holds the control lever in either the UP or DOWN position until the hydraulic cylinder is either fully extended or closed. A lever partially pulled back will return to neutral automatically when released. Observe the following operational points:

1. Keep your hand on the control valve lever during the lifting operation, ready to select neutral when the correct height is attained.
2. Observe the load and position of the lift arms at all times.
3. Only select the detent position when the type of maneuver requires it.
4. Observe the following warning:



**WARNING:** When using the hydraulics to operate a front end loader (bucket or forks) it must be equipped with a suitable restraining device to prevent the load (hay bales, fence posts, rolls of fence wire, etc.) from rolling down the lift arms into the operator's compartment and crushing the driver. The ROPS frame is not designed or intended to protect the operator from loads falling down the lift arms.

## Using implements requiring large volumes of oil

Implements with large cylinders can remove substantial volumes of hydraulic oil from the transmission/hydraulic system of the tractor. Carry out the following procedure:

1. Cycle all implement cylinders after starting the tractor.
2. Check the transmission/hydraulic oil level, (see Maintenance section); ensure that the level is up to the 'MAX' mark on the dip stick.
3. Check the transmission/hydraulic oil level Daily or Every 10 Hours.



# Operation

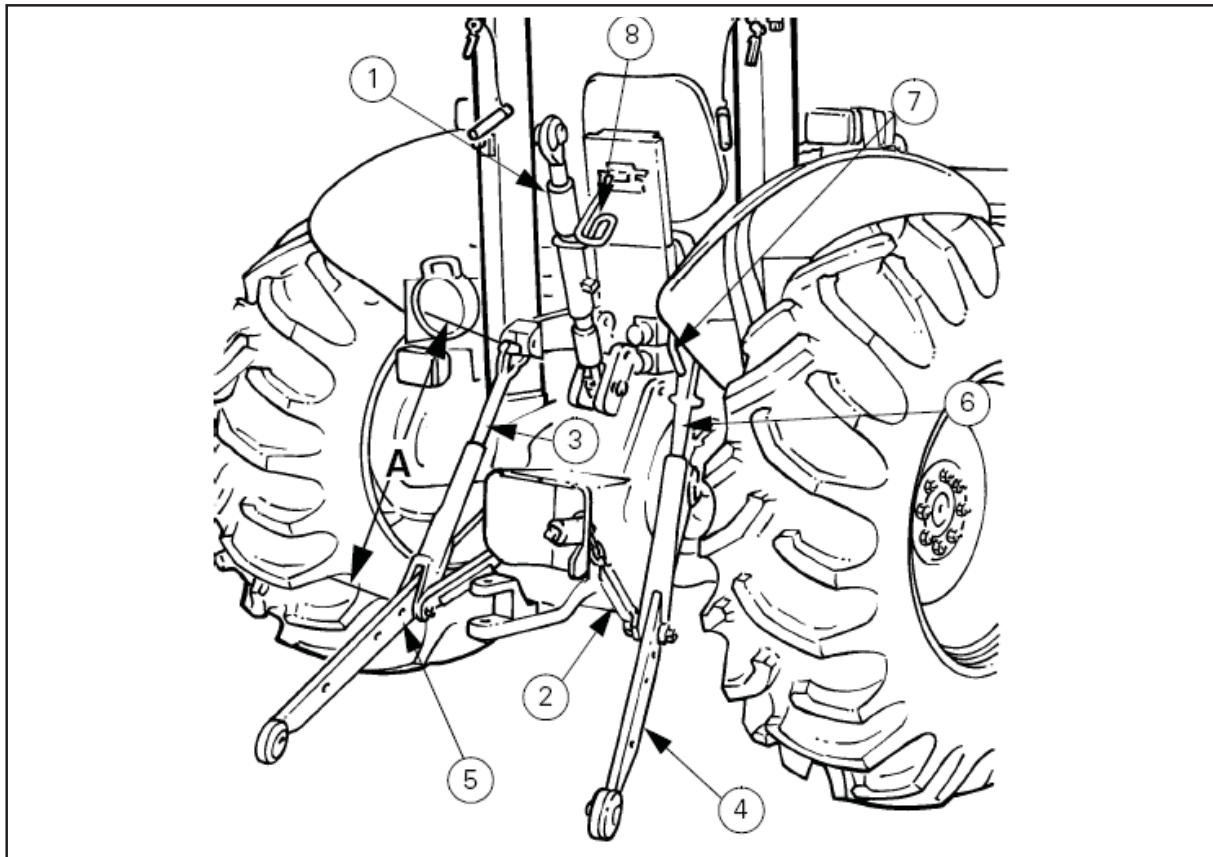


Fig. 66

## Lifting linkage

The lower links, (4, Fig. 66) absorb most of the load exerted by a mounted, or semi-mounted implement. The links are raised and lowered by the action of the lift arms. The lift arms are connected to the lift rods (3) and (6) which couple the lift arms to the lower links (4). The lower links are ball jointed to allow the implement to float sideways slightly when operating, but excessive sideplay which would allow the implement to contact the rear tires is prevented by the lower link stabilizers (2).

The right-hand lift rod (6) can be adjusted for length to facilitate the fitting of implements, or leveling the implement to allow the tractor to work at a different angle in relation to the ground. The leveling lever (7) is used to screw or unscrew the upper and lower components of the lift rod to adjust the length.

Key to Fig. 66:

1. Top link.
2. Stabilizer.
3. Left-hand lift rod.
4. Lower links.
5. Alternative lower link position.
6. Adjustable lift rod.
7. Levelling lever.
8. Top link stowage hook.

## Top link



**WARNING: DO NOT, in any circumstances, attempt to pull or tow from the top link connection. DO NOT operate the tractor with the threads showing.**

The top link, (1, Fig. 66) length is adjusted by turning the sleeve. The latch must be pulled back before the sleeve can be turned. The top link is adjusted when the implement is fitted to give the correct operating angle. When transporting the tractor, hook the link into the raised position using the stowage hook.

## Lift rod length

The lift rod, (3) must be set to the correct length to obtain the optimum implement depth and maximum transport height. The left-hand lift rod length (dimension 'A') is set at the factory to 573 mm (22.56 in). For normal lift height, fit the linkage as shown in (Fig. 66). If an implement is fitted which requires a higher lift capacity, the lift rods can be relocated in an alternative hole, (5). This latter position reduces the operating arc of the lower link end.

**NOTE:** The lift rod bolts must always be adjusted so that they can rotate. The bolts must also be through the corresponding holes in both lower link arms.



### Lower links

When fitting implements to the lower links, always fit the left-hand link first and use the levelling lever, as necessary, to assist in the fitting of the right-hand link. The maximum recommended lift load for normal working is 1415 kg.

### Interchangeable ball ends

To change ball ends (Fig. 67) from Category 1 to Category 2 or vice versa, proceed as follows:

1. Pull the spring clip upwards, as shown.
2. Rotate the ball until the narrow section aligns with the slot in the lower link, then remove the ball. The ball comes out from one side only.
3. Fit the new ball by locating it with the narrow section in line with the slot, then refit the spring clip as shown.

**NOTE:** Always ensure that with the implement fitted the linkage can travel through its full range without straining the stabilizers.



**CAUTION:** When servicing or adjusting implements mounted on the 3-point linkage in the raised position, observe the following precautions:

- \*The implement must be supported on a stand or other suitable blocking to support the implement at all times.
- \*Ensure that the stand and tractor are on firm level ground.
- \*Never use concrete blocks, bricks or old rotted timbers for support. They collapse - even under light loads.
- \***DO NOT** work under any implement supported on a jack.

**NOTE:** Always ensure that with the implement fitted the linkage can travel through its full range without straining the stabilizers.

### Stabilizers

The stabilizers (Fig. 68) will control the sway of the lower links and attached equipment when in work or being transported. This is especially important when operating on slopes or near fences, walls or ditches and with certain implements. Check your Implement Operator Instruction Book.

Once fitted the stabilizers need not be removed from the tractor, but to ensure easy and efficient operation the following points must be observed:

1. Check chains must be removed when the stabilizers are fitted.
2. Ensure that the stabilizers have sideways movement when the links are fully raised.

#### Stabilizer adjustment:

1. For fine adjustment (Fig. 68). Rotate the turnbuckle(1) as required.
2. For coarse adjustment, remove the lock pin (2) and lengthen or shorten the stabilizer as required. Replace the lock pin.

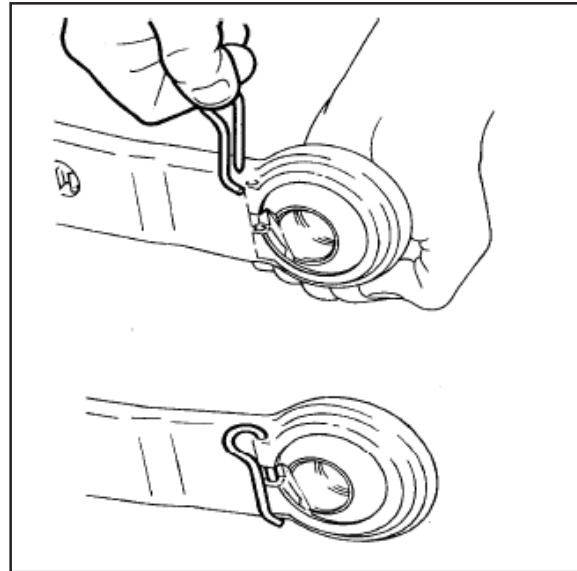


Fig. 67

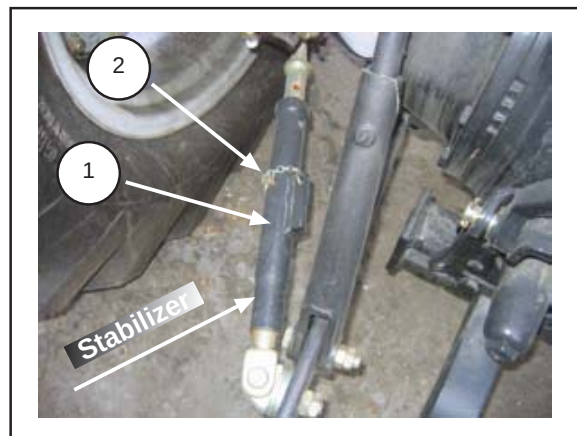


Fig. 68

# Operation

## Attaching an implement



**WARNING:** If two people are involved in attaching an implement, great care must be taken. When making any adjustment to the hydraulic lift system the person in the area of the linkage must stand clear.

1. Place the Draft Control Lever in the fully raised position.
2. Lower the links using Position Control, back the tractor up to the implement, raise the lower links so that the left-hand link is in line with the pin on the implement.
3. Apply the parking brake before dismounting from the tractor.
4. Fit the left-hand lower link first and secure with a lynch-pin. If any small up and down adjustments of the lower links are necessary they must be made from the driver's seat.
5. Attach the right-hand lower link to the implement. Use the leveling lever if necessary to adjust the height of the link, then fit the lynch-pin.
6. Attach the top link to the hitch point on the tractor (Fig. 69).

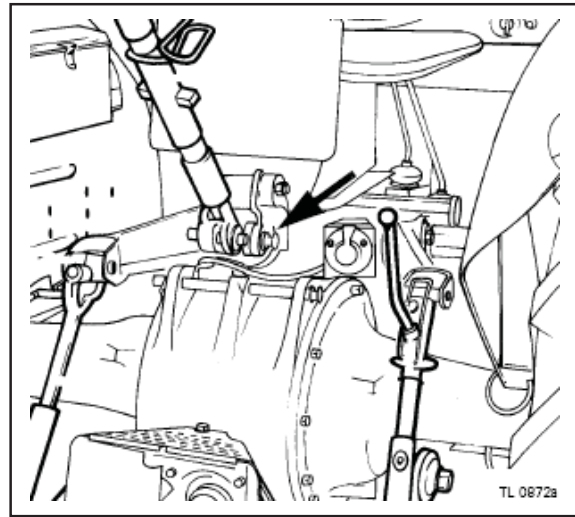


Fig. 69

On implements which have variable top and bottom attachment points, the linkage should be connected in accordance with the dimensions given in Table 1 depending on the category of linkage used (Fig. 70).

| Linkage type | A<br>Lower link width | B<br>Lower link width |
|--------------|-----------------------|-----------------------|
| Category I   | 683 mm (27 in)        | 460 mm (18 in)        |
| Category II  | 825 mm (33 in)        | 610 mm (24 in)        |

Table 1 Linkage to ISO standard 730/1

With heavy implements this will reduce unnecessary strain on the tractor and loss of lift capacity. Some implements have two or more optional positions for the lower links. Providing the implement will penetrate to the required depth, reasonably rapidly, it is usually best to use the lowest pick-up point provided. This will give the maximum weight transfer, minimize hydraulic system pressure and power losses. Also giving maximum transport height and allowing the use of the correct 'A' frame height setting on the implements.

7. If the leveling lever was used to facilitate the attachment of the right-hand lower link, adjust the right-hand lift rod to its normal operating length by screwing the lift rod in or out until the implement is level.
8. Adjust the top link as necessary to level the implement
9. Adjust the length of the stabilizer (Fig. 68).
10. Connect the implement to the PTO shaft, if required, and attach guards (see page 43).
11. Raise and lower the implement, checking clearances and general operation.

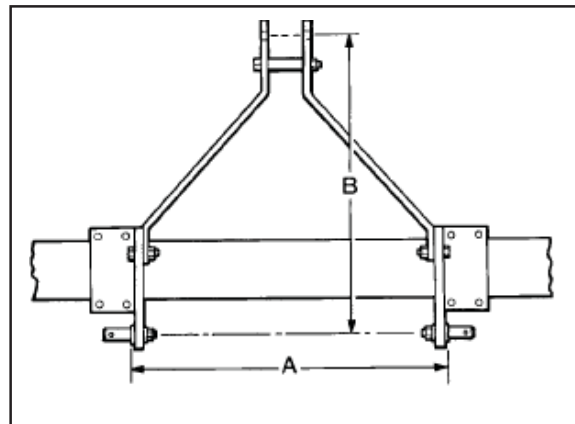


Fig. 70

### Detaching an implement



**WARNING:** *If two people are involved in detaching an implement, great care must be taken. When making any adjustment to the hydraulic lift system the person in the area of the linkage must stand clear.*

1. Select a level area as this will make detaching much easier.
2. Lower the implement using Position Control (see page 45), or where necessary, raise the implement to fix parking stands in position then lower the implement to the ground.
3. Stop the engine and apply the parking brake before dismounting from the tractor.
4. Unscrew the top link to remove the weight of the implement and remove the pivot pin. Stow the lynchpin, and then stow the top link in its clip.
5. Detach the lower links and stow the lynch-pins in the links in the stowage points provided.
6. Open up the PTO shield and the shaft.
7. Disconnect hydraulic hoses and cap the ends. Replace the dust caps on the control valve couplings.
8. Start the engine and drive the tractor forward before returning the Position Control to the "Transport" position.

### Pressure relief valve

Avoid using the tractor hydraulic system in any way which may cause the pressure relief valve (which is internal), to discharge continually. This can be caused by attempting to raise a load at the lower links, greater than that which the system is capable of lifting. Although the relief valve will prevent damage to other parts of the hydraulic system, unnecessary discharge must be avoided, as damage to the relief valve may result in over heating the system and a reduction in the maximum hydraulic pressure.

### Safety chains

When towing implements on the highway, use a safety chain (Fig. 71) with a tensile strength equal to or greater than the gross weight of the implement to be towed by the tractor. This will control and retain the implement in the event that the hitch pin is lost. After attaching the safety chain, make a trial run by driving the tractor to the right and to the left for a short distance to check the safety chain adjustment. If necessary, readjust to eliminate tight or loose chain.

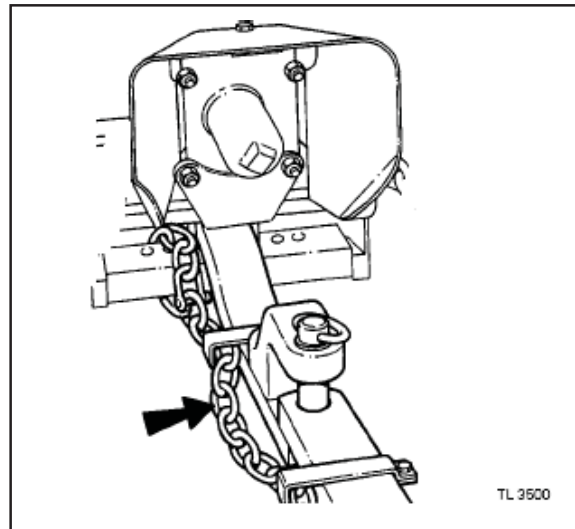


Fig. 71

# Operation

## Attaching and detaching trailed equipment To and from the drawbar



**WARNING:** A rear turn-over can result if pulling from the wrong location on the tractor. Hitch only from the drawbar. Use the 3-point linkage only with implements designed for its use, NOT as a drawbar.

**IMPORTANT:** Follow the implement manufacturer's recommendations in adjusting and aligning the implement and implement driveline with the tractor. The swinging drawbar may be fixed in any of a number of positions or allowed to swing the full width of the hanger. Fasten the drawbar in position using the swing-limiting pins when pulling implements which require accurate positioning and when transporting on the road. If both tractor and implement are equipped with a drawbar clevis, remove the clevis from the tractor or implement. **DO NOT** put a long drawbar pin through both the implement clevis and the drawbar clevis. Allow the drawbar to swing when pulling ground engaging implements which do not require accurate positioning. This will make steering and turning easier.

When connecting implements that are towed, use the correct drawbar pin and lynch-pin, or, use a hard steel pin and hold in place with a lock pin or cotter pin. Make sure that the drawbar pin does not make contact with the PTO driveline. When working with the drawbar, raise the lift arms to the transport position. When working with the PTO, set the drawbar to the center position, lock in this position using the swing limiting pins.

### Swinging drawbar

This type of swinging drawbar (Fig. 72) cannot be converted for use with an automatic trailer hitch.



**WARNING:** The drawbar must be correctly set for the implement being towed.

**\*DO NOT connect a tractor clevis to an implement clevis as this will strain the drawbar pin. Remove the bolt-on clevis from the tractor drawbar to ensure a satisfactory hitch.**

**\*Always secure the drawbar to prevent swinging when transporting equipment or when operating anything but ground engaging equipment.**

**\*Always use the correct drawbar pin with a securing device to prevent the pin coming out during operation.**

**\*DO NOT exceed the maximum static downward loads as shown in the chart below.**

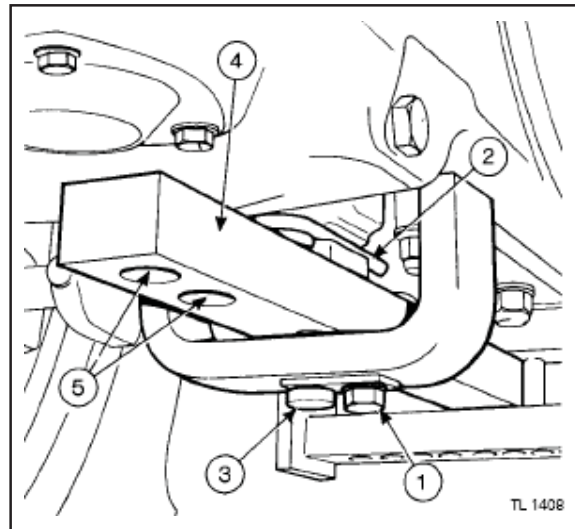


Fig. 72

The drawbar can swing or can be held at fixed positions by relocating the stop pins in the drawbar support frame. The drawbar can be inverted and the clevis attachment bolted on either side to suit pick up points of various implements (Fig. 73). There are three length positions for the drawbar.

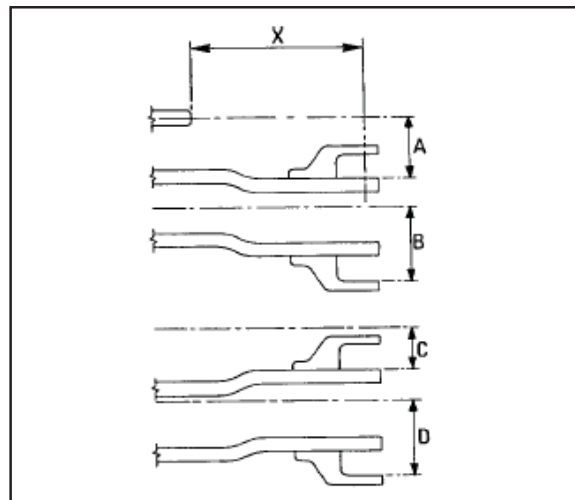


Fig. 73

| Drawbar position | Distance of clevis from end of PTO shaft 'x' | Maximum static loadings |
|------------------|----------------------------------------------|-------------------------|
| Inner position   | 245 mm (9.7 in)                              | 1000 kgf (2205 lbft )   |
| Center position  | 359 mm (14 in)                               | 775 kgf (1710 lbft )    |
| Outer position   | 410 mm (16 in)                               | 775 kgf (1710 lbft )    |

Table 2 : distance from the clevis hitch point 'X' to the PTO shaft and the maximum vertical static loadings.

**Drawbar length**

To adjust the drawbar for length (Fig. 72) proceed as follows:

1. Remove the bolt and keep plate (1).
2. Pull the pin retaining spring (2) to the left side release the pin. Remove the drawbar pin (3).
3. Reposition the drawbar (4) using one of the three holes (5) (See Table 2).
4. Refit the pin (3), keep plate and bolt (1).

**Drawbar height**

To adjust the drawbar height ( Fig. 73) proceed as follows:

1. Remove the drawbar pivot pin as described in 'Drawbar length'.
2. Remove the clevis and reposition in one of the positions shown, (Fig. 73), the dimensions from the center of the PTO shaft are given in Table 2. Tighten the bolts to a torque of 230 Nm (170 lb.ft).
3. Refit the drawbar

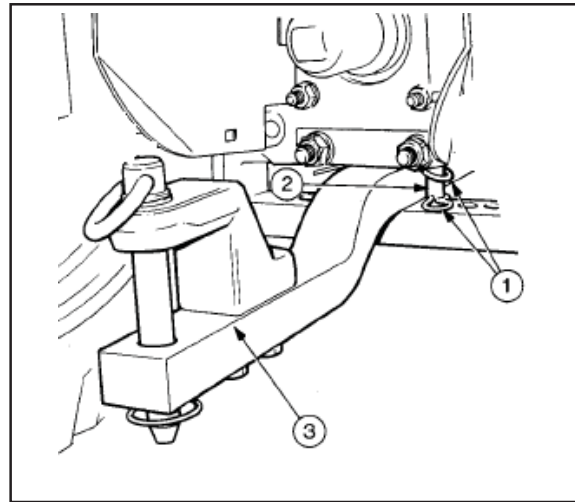


Fig. 74

| Position | Height           |
|----------|------------------|
| A        | 165 mm (6.5 in)  |
| B        | 270 mm (10.5 in) |
| C        | 67 mm (2.6 in)   |
| D        | 172 mm (6.8 in)  |

Table 3

**Drawbar lateral adjustment**

The drawbar (Fig. 75) may be fixed in any one of five positions or allowed to swing the full width of the frame.

The maximum lateral swing is 240mm (9.5 in). To change the position of the drawbar ( Fig. 74)

1. Remove the four 'R' clips (1).
2. Remove the two limit pins (2).
3. Reposition the drawbar (3), and refit the pins and 'R' clips (Fig. 74), or leave it free to swing. Store the pins and 'R' clips in the tool box when not in use. Drawbar off-set when in the center hole (Fig. 75).

| Position | Drawbar off-set |
|----------|-----------------|
| A        | 198 mm (7.8 in) |

Table 4

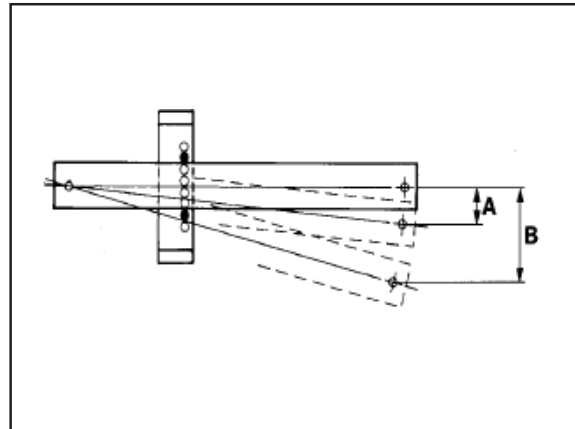


Fig. 75

Allow the drawbar to swing when pulling ground engaging equipment which does not require accurate positioning. This will make steering and turning easier. Fix the position of the drawbar when pulling or transporting equipment which requires accurate positioning.

**NOTE:** The lock-nuts securing the drawbar frame to the underside of the tractor must be kept tightened to a torque of 420 Nm (310 lbf ft). The lock-nuts securing the drawbar frame must be kept tightened to a torque of 245 Nm (180 lbf ft).



# Operation

## Front-mounted weight frame (if fitted)

The front-mounted weight frame (Fig. 76) is bolted to the front support casting. A maximum of eight 27 kg (60 lb) weights can be fitted. A towing hitch hole and pin are provided in the open center of the frame.

*Attaching the weights*

1. Hook the top of the weight over the weight frame with the base of the weight tilted outwards. Lower the weight.
2. Secure the weight in place with the bolt.

## Roll-over protective structure (ROPS)

The ROPS frame is designed to give protection to the driver in the event of a roll-over. The 'fold-down' frame can be folded down for transport on a truck, or the tractor functionally used with the frame down for low clearance situations such as orchards, vineyards, barns and chicken houses etc. When the ROPS frame is in the lowered position the seat belt must **NOT** be worn. Drive with extra care. In this position roll over protection is not provided. The ROPS frame **MUST** be maintained in its fully raised position at all times unless practical operations of the tractor dictates otherwise as described above. After raising the ROPS frame into its fully erected position, lock it immediately. The seatbelt **MUST** be worn. If the ROPS frame is damaged during operation:

**DO NOT** - weld, drill, bend or straighten.  
**DO NOT** - use the tractor with a damaged frame.

Also observe the following:

**DO NOT** - attach chains, ropes or cables to the ROPS frame for pulling purposes, always pull from the tractor drawbar.

**DO** - ensure that the frame is securely fastened to the tractor.

**DO** - ensure that all components are in correct working order in order to provide the intended protection.

**DO** - use only original Massey Ferguson supplied parts to maintain structural integrity.



**WARNING:** The following additional safety precautions must be strictly observed:

*\*Use a seat belt at all times unless the frame is down, and keep it snugly adjusted.*

*\*If the tractor is overturning, hold on to the steering wheel. DO NOT attempt to jump clear. If the ROPS frame is down, abandon the tractor immediately.*

*\*Ensure that the safety signs are located on the frame at all times and that their instructions are observed.*

*\*If a sun canopy is fitted, it does not provide the operator with protection from falling objects.*

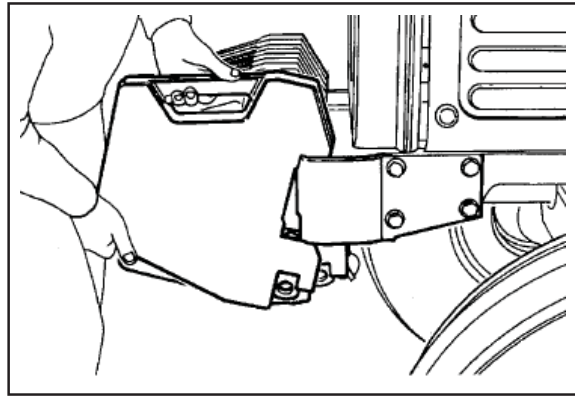


Fig. 76



Fig. 77

## Field fold-down ROPS frame

To fold down and erect the frame (Fig. 77) proceed as follows:

1. Remove the two lynch-pins.
2. Hold the frame steady and withdraw both locking pins.
3. Using extreme care (the upper frame is heavy) and standing to one side, fold the frame down to the rear. **DO NOT** let it fall freely.
4. **DO NOT** allow the frame to strike any parts of the tractor; for example, rear work light, top link etc.
5. To erect the frame, reverse the procedure ensuring that your hands are kept away from hinged parts.

# Maintenance and Adjustment

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# Maintenance and Adjustment

## Maintenance Chart

| ITEM                        |                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|-----------------------------|---------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                             |                                                                     |  |  |  |  |  |
|                             |                                                                     | <i>Flex</i><br><i>**</i>                                                            | 100<br>hours                                                                        | 250<br>hours                                                                        | 500<br>hours                                                                        | 1000<br>hours                                                                       |
| GREASE POINTS               | Grease all grease nipples, (see page 62) for positions              |                                                                                     | 1                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| ENGINE                      | Check the engine oil level and top up if necessary.                 | 2                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                             | Change the engine oil and filter.                                   |                                                                                     |                                                                                     | 3                                                                                   |                                                                                     |                                                                                     |
|                             | Check valve tip clearances                                          | 4 - Every 1500 hours - Dealer                                                       |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| FUEL SYSTEM                 | Drain the sediment from the fuel filter bowl.                       | 5                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                             | Change the fuel filter element.                                     |                                                                                     |                                                                                     |                                                                                     | 6                                                                                   |                                                                                     |
|                             |                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| AIR CLEANER                 | Check and clean the dry air cleaner MAIN element.                   | 9                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                             | Change the dry air cleaner MAIN element.                            |                                                                                     |                                                                                     |                                                                                     |                                                                                     | 10                                                                                  |
|                             | Change the INNER SAFETY ELEMENT every 1000 hours.                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     | 11                                                                                  |
| COOLING SYSTEM              | Check the radiator coolant level and top up if necessary.           | 12                                                                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                             | Clean the radiator fins.                                            | 13                                                                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                             | Drain, flush and refill the cooling system.                         |                                                                                     |                                                                                     |                                                                                     |                                                                                     | 14                                                                                  |
| ELECTRICAL SYSTEM           | Check battery condition and smear terminals with petroleum jelly.   |                                                                                     |                                                                                     | 15                                                                                  |                                                                                     |                                                                                     |
|                             | Check the tension of the alternator/fan belt.                       |                                                                                     |                                                                                     | 16                                                                                  |                                                                                     |                                                                                     |
| STEERING                    |                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                             | Check the front wheel hub adjustment (two-wheel drive).             |                                                                                     |                                                                                     |                                                                                     | 18                                                                                  |                                                                                     |
|                             | Check the front wheel alignment.                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     | 19                                                                                  |
| TRANSMISSION AND HYDRAULICS | Check the transmission/hydraulic oil level and top up if necessary. |                                                                                     | 20                                                                                  |                                                                                     |                                                                                     |                                                                                     |
|                             | Change the transmission/hydraulic oil.                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     | 21                                                                                  |
|                             | Clean the hydraulic linkage pump oil strainer.                      |                                                                                     |                                                                                     |                                                                                     |                                                                                     | 22                                                                                  |
|                             | Check the differential lock pedal clearance.                        |                                                                                     |                                                                                     |                                                                                     | 23                                                                                  |                                                                                     |
| CLUTCH                      | Check the clutch pedal free travel and adjust if necessary.         |                                                                                     | 24                                                                                  |                                                                                     |                                                                                     |                                                                                     |
|                             | Check and adjust the live PTO clutch.                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     | 25                                                                                  |
| BRAKES                      | Check the brakes and adjust if necessary.                           |                                                                                     |                                                                                     | 26                                                                                  |                                                                                     |                                                                                     |
| WHEELS AND TIRES            | Check all tire pressures.                                           |                                                                                     | 27                                                                                  |                                                                                     |                                                                                     |                                                                                     |
|                             | Check wheel nut tightness.                                          |                                                                                     |                                                                                     | 28                                                                                  |                                                                                     |                                                                                     |

Table 5

Symbols and numbers cross refer to the tractor maintenance and lubrication chart, see page 59 for location purposes.

**NOTE:** \*\* Flexible maintenance times vary according to individual conditions of operation. You must establish times for servicing flexible items. An average interval time for checking these items is at each fuel fill.

## Maintenance and Adjustment

### Tractor lubrication chart

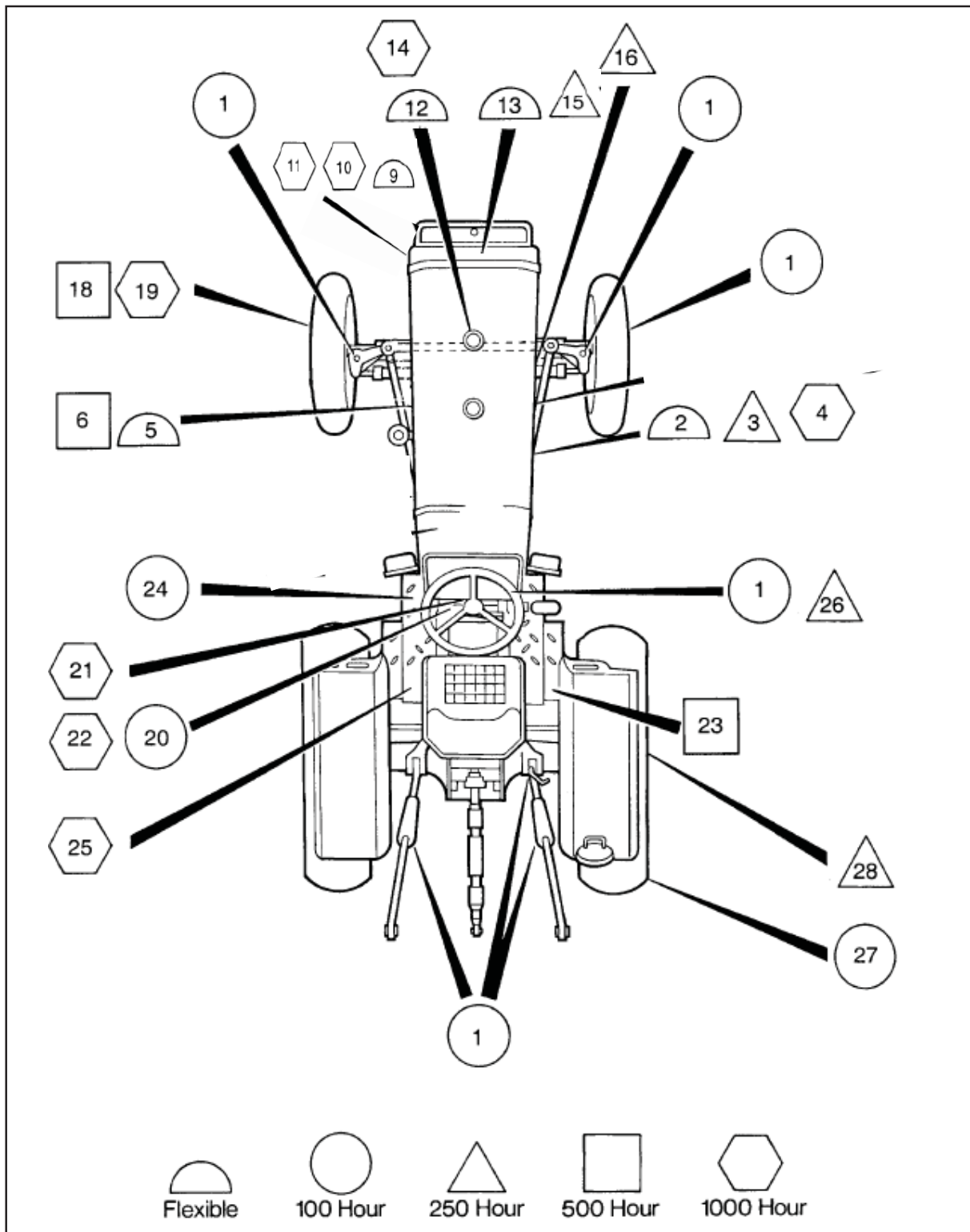


Fig. 78

# Maintenance and Adjustment

## Massey Ferguson recommended lubricants

Engine specification:

Use MULTIGUARD® 5W30 Motor Oil,  
or  
MULTIGUARD® 15W40 Motor Oil,  
or  
MULTIGUARD® 10W30 Motor Oil,  
or  
MULTIGUARD® Straight Weight Motor Oil.

Capacity:  
All models

6,8 liters (1.8 US gal )

Requirements:

Oil must meet the following minimum specification:

API CC/CCMCD1 or API CD/CCMCD2

Viscosity:

| Ambient temperature range |           |             | Oil viscosity - SAE number                          |
|---------------------------|-----------|-------------|-----------------------------------------------------|
|                           | Degree °F | Degree °C   |                                                     |
| Cold                      | Below 41  | Below 5     | 10W, 10W/20, 10W/30                                 |
| Temperature               | 25 to 81  | - 4 to + 27 | 10W/30, 20W, 15W/30, 20W/30, 10W/40, 15W/40, 20W/50 |
| Hot                       | Above 64  | Above 18    | 15W/40, 20W/30, 20W/40, 20W/50, 30W                 |

Table 6

Transmission and Hydraulics  
Specification:

PERMATRAN III®

Capacity:  
410, 420, 430

35,0 liters ( 9.2 US gal )

Four-wheel Drive Front Axle (MF 420 only)

PERMATRAN III®

Capacity:  
Axle  
Planetary hub (each side)

3.75liters (1.0 US gal )  
0.2 liters (0.35 US pints )

20.11 SD type Four-wheel Drive Front Axle (MF 430 only)

Capacity:  
Axle  
Planetary hub (each side)

5.5 liters (1.5 US gal )  
0.2 liters (0.42 US pints )



# Maintenance and Adjustment

---

## Grease Points

Use HI TEMP EP2 GREASE,  
Or  
MULTI-PURPOSE LITHIUM #2.

Grease points are located as follows:

|                                         |           |
|-----------------------------------------|-----------|
| Front wheel hubs                        | 2 points. |
| Front axle pivot pins                   | 2 points. |
| Front axle swivel pin                   | 2 points. |
| Brake pedal bearing                     | 1 point.  |
| Lift rods and levelling box             | 3 points. |
| Four-wheel drive swivel pins            | 4 points. |
| Four-wheel drive pivot pin              | 1 point.  |
| Four-wheel drive shaft universal joints | 2 points. |
| Four-wheel drive shaft sliding coupling | 1 point.  |
| Four-wheel drive axle universal joints  | 2 points. |

## Oil can lubrication

With an oil can lubricate throttle and control linkage every 250 hours.

### **IMPORTANT:** Severe working conditions:

*Where tractors are operating arduous work cycles, or when working in areas where there are dusty conditions, paddy fields, deep water etc., coupled with a lack of maintenance care and low specification fuel and oil, the intervals of service should be halved, particularly for oil and filter changes*



**WARNING: Tractor lubricants and greases: No significant hazard when properly used and in the application for which they were designed. Frequent and/or prolonged skin contact may give rise to skin irritations. Emergency treatment of acute effects:**

\*Ingestion: **DO NOT** induce vomiting. Administer 250 ml (1/2 pint) milk or 50 ml olive oil. Seek medical advice.

\*Skin Contact: Remove by wiping, wash with soap and water.

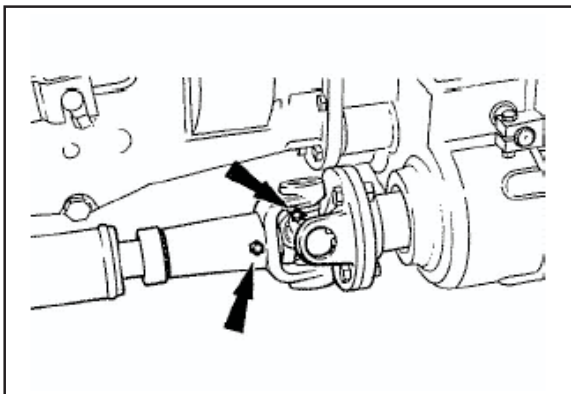
\*Inhalation: Saturated vapor non-toxic at room temperature. - Remove from exposure.

\*Eye contact: Wash with large amounts of warm water.

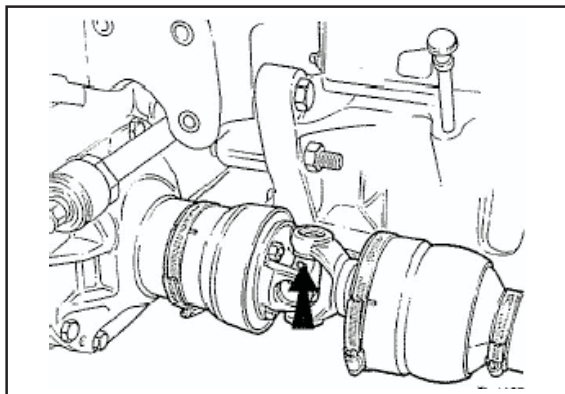
## Maintenance and Adjustment

### Grease lubrication points

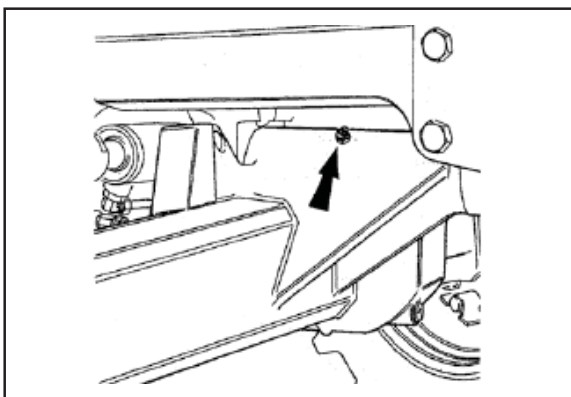
Grease the fittings illustrated below with a good quality lithium -based grease.



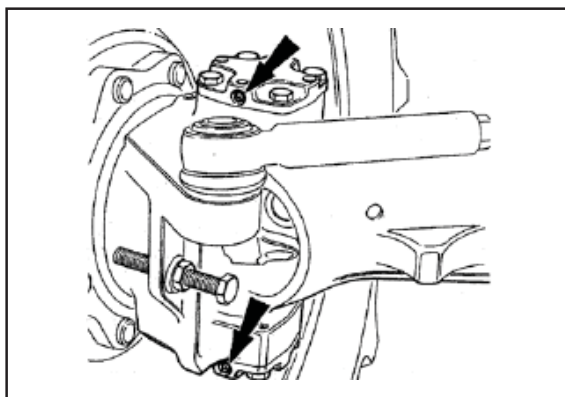
*Drive shaft rear - Four wheel drive front axle.  
Grease every 100 hours - 2 points. Slide back the drive  
shaft guard (guard removed for clarity).*



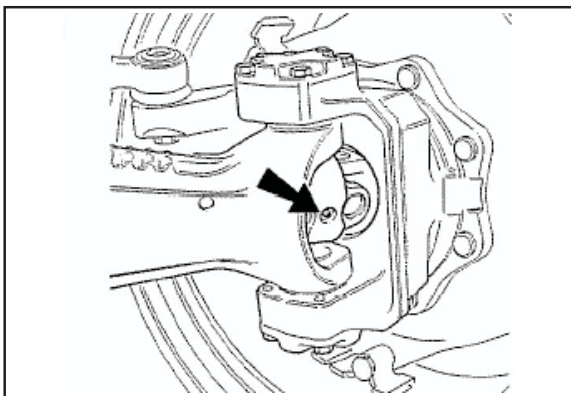
*Drive shaft front - Four wheel drive front axle.  
Grease every 100 hours - 1 point. Slide back the drive  
shaft guard (guard removed for clarity).*



*Front axle pivot pin - Four-wheel drive front axle.  
Grease every 100 hours - 1 point.*

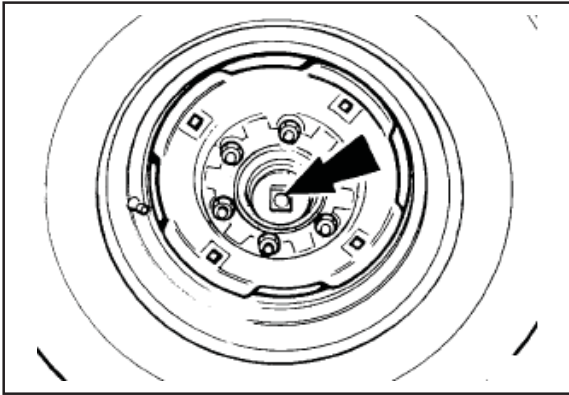


*Front axle swivel pins - Four-wheel drive front axle.  
Grease every 100 hours - 4 points.*

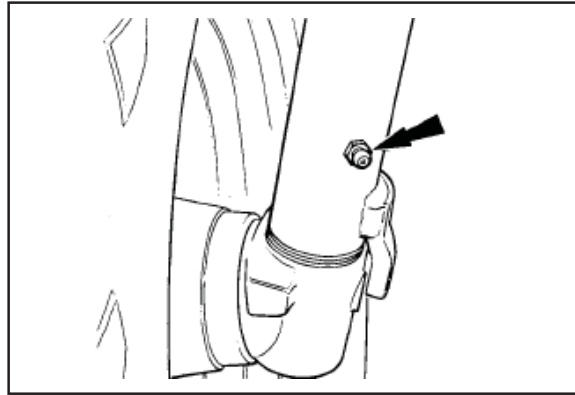


*Universal joints - Four-wheel drive front axle.  
Grease every 100 hours - 2 points.*

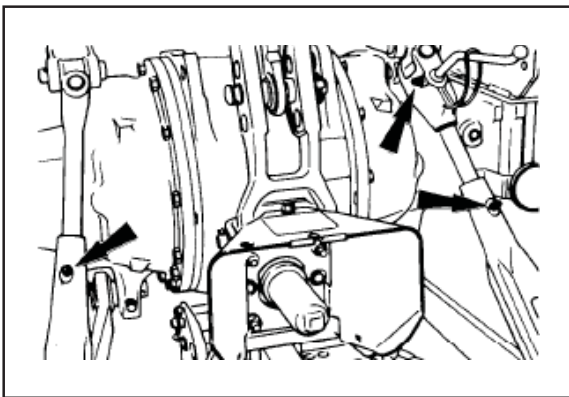
## Maintenance and Adjustment



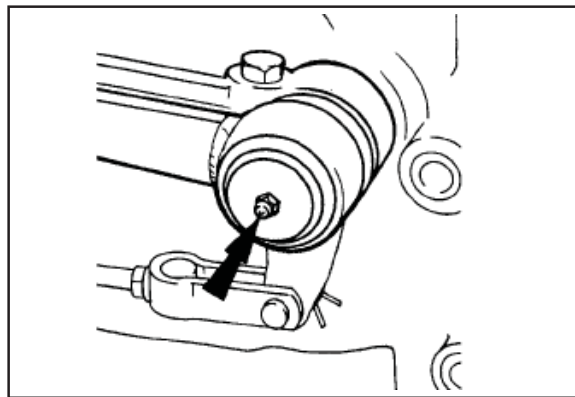
*Front wheel bearings - two wheel drive.  
Grease every 100 hours - 2 points.  
Grease daily in adverse conditions.*



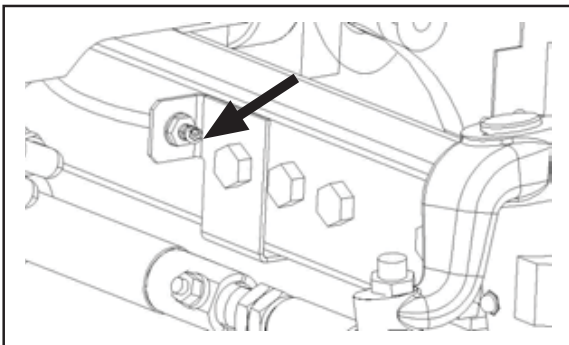
*Front axle swivel pins - two wheel drive.  
Grease every 100 hours .  
One lubrication point each side.*



*Lift linkage.  
Grease every 100 hours - 3 points.*



*Brake pedal bearing/  
Grease every 100 hours - 1 point.*



*Front axle pivot pin - two wheel drive  
Grease every 100 hours - 1 point.*

# Maintenance and Adjustment

## Maintenance and adjustment

### Preliminary service inspection

When your new Massey Ferguson tractor has completed 50 hours work a Service Inspection is recommended to be undertaken by your Dealer. This involves a complete check of the tractor, routine adjustments, checking oil levels and changing the engine oil to remove factory fill oil and filter. Full details will be found in the Tractor Service Record Book.

**IMPORTANT:** A charge will be made for any filter elements and lubricants used. Labor charges will be at the discretion of your Dealer.

Please contact your Massey Ferguson Dealer to agree a convenient time when this work can be carried out. We strongly recommend you take advantage of this postdelivery inspection and also be present when the service is carried out. This will provide an opportunity to discuss any operational problems with the Service Technician.

### Routine service

This section gives full details of the service procedures necessary to maintain your tractor in peak efficiency. Also information on how to make the adjustments required in setting up the tractor for work. In order to obtain the best results, it is important that the tractor has regular preventive maintenance. It is recommended that the major services (500 and 1000 hour) are conducted by your local Massey Ferguson Dealer under the Massey Ferguson Recommended Service Program. It must be remembered that the responsibility for maintaining your tractor in a safe and roadworthy condition rests with you, the owner. Service the tractor at the intervals shown in the following pages. Use only high quality lubricants when servicing. It is a recommendation that maintenance is done under cover, and at the end of an operating period so that the oils are warm and drain easily.

\*Before using a grease gun, clean the grease fittings.

\*Before removing drain and filler plugs, clean the area around the plug and cap.

\*Always use a clean container for fresh oil or diesel.

### Flexible maintenance

The term 'Flexible Maintenance' is used in this publication to indicate a variable service period. Flexible maintenance times vary according to individual conditions of operation. You must establish your own times for servicing flexible items. An average interval time for checking is at fuel fill.

### Protect the environment

It is illegal to pollute drains, water courses or soil. Use authorized waste disposal facilities, including civic amenity sites and companies providing facilities for providing facilities for receipt of used oil. If in doubt, contact your local authority for advice.



Fig. 79

### Hourmeter

The engine hourmeter (Fig. 79) shows the hours the tractor has worked at 1500 rpm average. Use the hourmeter to service the tractor at the correct periods.

### Safety in servicing



**WARNING:** When changing oil it is important to follow some basic rules on personal hygiene, these are as follows:

\*Before changing the oil use a suitable barrier cream on your hands.

\*Wear protective clothing, overalls, PVC gloves etc.

\*Wash off dirty oil with soap and water as soon as you have finished changing the oil. Contaminated clothing must be removed and cleaned.

\*Prolonged contact with dirty oil may affect your health, therefore it is important that you follow the above instructions.

\*DO NOT service the tractor with the engine running.

\*Keep hands, tools and items of clothing clear of all moving parts. Avoid skin contact with the exhaust pipe and manifold. They may be hot and will burn you.

\*Keep children and pets clear of the tractor. DO NOT allow anyone on the tractor unless specifically working to your instructions.

\*DO NOT work beneath the tractor with a lifting jack as the only support. Place suitable stands under the tractor as a safety precaution.

\*Provide facilities for receipt of used oil. If in doubt, contact your local authority for advice.

## Maintenance and Adjustment

### Service access

#### Front grille

The front grille (Fig. 80) provides access to the battery (Fig.81), headlight bulbs, air cleaner and wiring only. To remove the grille pull the MF emblem grasping underneath (Fig 80), remove the chain and lift out the grille; the headlamp wiring can be disconnected if necessary.



Fig. 80

To access the battery for servicing simply remove the grille as mentioned above (Fig. 81).

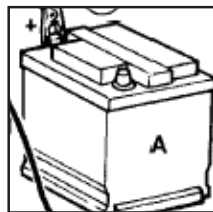


Fig. 81

### Radiator cap



**WARNING:** High pressure steam and hot water. Remove the radiator cap with extreme care.

To remove the radiator cap (Fig. 82), open the cover, press the radiator cap down and turn slowly counter clockwise to allow pressure to escape before removing it. This is particularly important if the engine is hot.

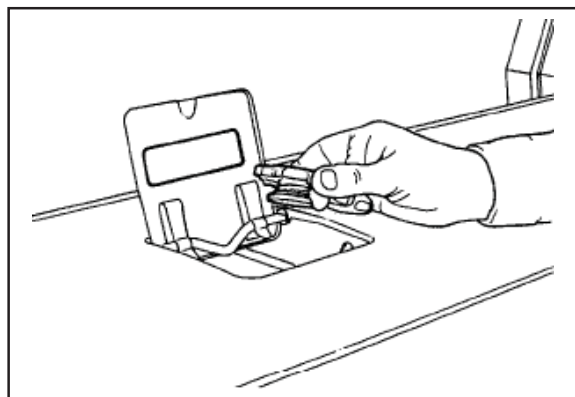


Fig. 82



## Maintenance and Adjustment

### Fuel filler



**WARNING:** Do not fill with fuel when the engine is hot or running.

To remove the fuel filler cap (rear of the two caps above the hood) - press the cap downwards and turn counterclockwise (Fig. 83). For further advice on diesel fuel and filling the tank (see page 94-95).



Fig. 83

### Hood and side panels

Access to the top of the engine, fuel tank and radiator is gained by removal of the hood and side panels (Fig. 84) as follows:

1. Remove the top-side panels (1).
2. Remove the rear hood securing bolts located behind the side panels (2).
3. Remove the front hood securing bolts located behind the side panels (3).
4. Lift off the hood.

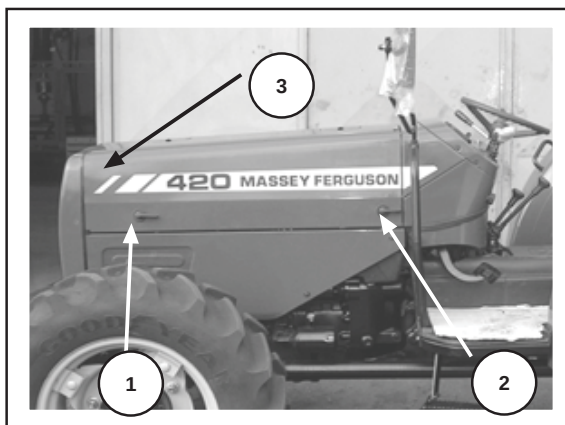


Fig. 84

# Maintenance and Adjustment

## Engine oil

### Engine oil level

Check the engine oil level - flexible maintenance. Check the oil level before starting work each day. If the engine has been running, stop the engine and allow the oil to drain back into the sump. Check the oil level with the dipstick (Fig. 85).

If necessary, remove the oil filler cap and top up with fresh oil of the correct grade. To raise the oil level from minimum to maximum it requires 1,5 liter (2 US pts). The oil level must be maintained between the 'MIN' and 'MAX' marks on the dipstick with the tractor standing on level ground.

### Changing the engine oil

Change the engine oil at first 50 hours, then 250 hours thereafter.

1. With the tractor standing on level ground, place a drain pan beneath the engine sump, then remove the engine sump plug (Fig. 86).
2. Allow the old engine oil to drain out completely.
3. Refit the drain plug and tighten securely
4. Change the engine oil filter.
5. Refill the sump with an approved oil, so that the oil level is between the 'MIN' and 'MAX' marks on the dipstick.

**NOTE:** Run the engine to circulate the oil and check for leakage. Time must then be allowed for the oil to settle in the sump before rechecking the level. Top up if necessary.

### Engine oil filter

Change the engine oil filter at first 50 hours, then 250 hours thereafter. The picture of the filter element (Fig. 85) shows a typical installation with a horizontal filter. On some tractors the filter is vertical. The change procedure is identical.

1. Put a drain pan under the filter to retain spilled oil.
2. Remove the filter canister (Fig. 85) with a strap wrench or similar tool. Ensure that the threaded adaptor is secure in the filter head. Then discard the canister.
3. Clean the filter head .
4. Smear a few drops of clean engine oil on the sealing ring .
5. Fit the new canister and tighten by hand only. **DO NOT** use a strap wrench.
6. To fill the oil filter with oil, ensure that there is oil in the sump. Turn the engine over with the starter motor until the oil pressure warning goes out.

**NOTE:** Run the engine to circulate the oil and check for leakage. Time must then be allowed for the oil to settle in the sump before rechecking the level. Top up if necessary.

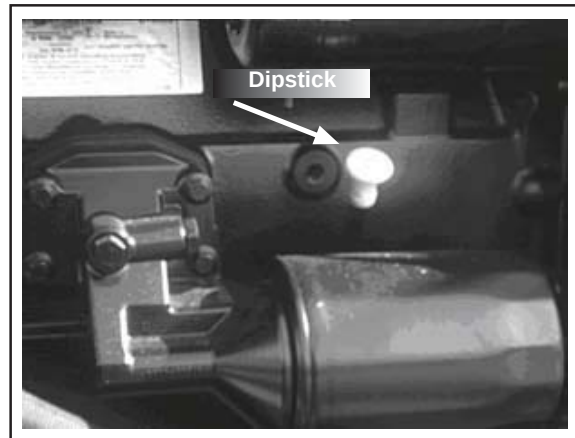


Fig. 85

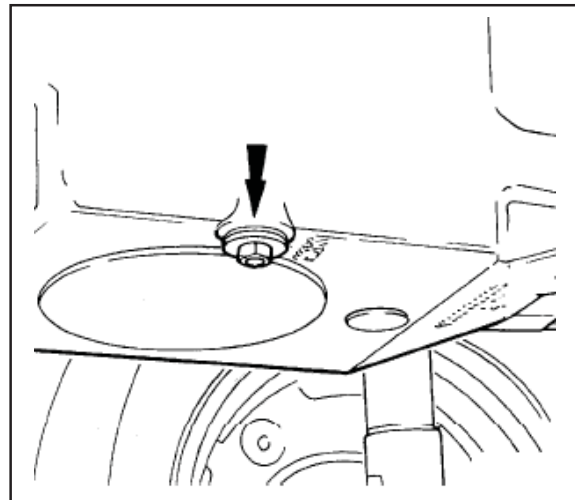


Fig. 86

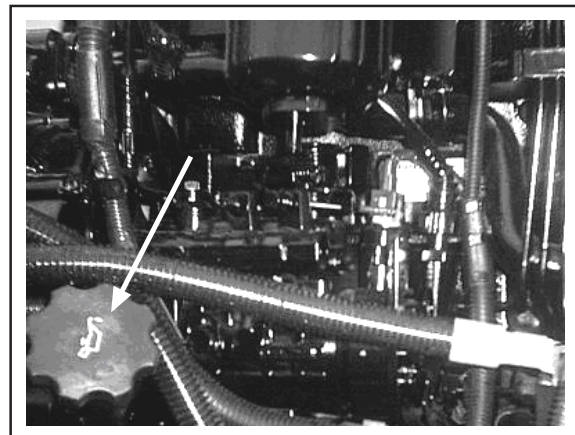


Fig. 87

# Maintenance and Adjustment

## Fuel filter

Change the fuel filter element every 500 hours.  
1. Place a suitable container below the fuel filter assembly to retain spilled fuel oil. Clean the outside of the filter assembly.

2. Open the drain tap (1, Fig. 88) at the bottom of the filter casing to drain the fuel from the filter.  
3. Use a strap wrench to loosen the filter casing. Remove the casing and element from the fuel filter head.

4. To remove the filter element from the casing; press down on the filter element (1, Fig. 89) against the spring pressure and rotate the element to the left to release it from the filter casing.

5. Put the new filter element inside the casing and press the element down against the spring pressure. Rotate the element to the right to lock the element into the casing.

6. Fit a new seal (3, Fig. 89) to the casing and lightly lubricate the seal face with clean fuel oil.

7. Check that the thread (2, Fig. 89) on the inside of the element is not damaged.

8. Fit the filter assembly to the filter head and tighten by hand until the filter assembly contacts the filter head. Tighten the assembly a further 1/8 of a turn by hand. Do not use a strap wrench.

9. Close the drain tap (1, Fig. 88) and remove the container.



Fig. 88

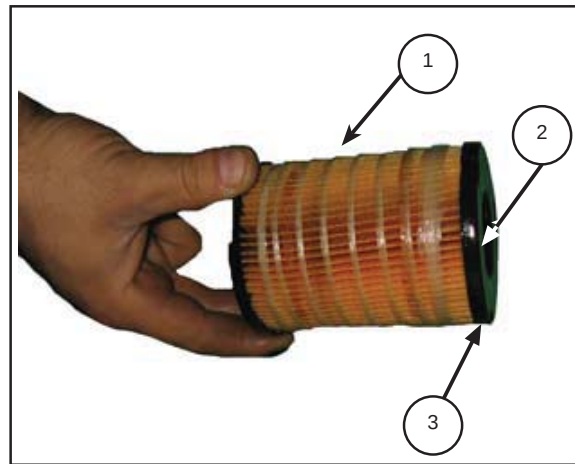


Fig. 89

## Removing air from the fuel system

If at any time air enters the fuel system, either due to fuel system servicing, running out of fuel, tractor standing idle for a considerable time or difficulty with starting, the following procedure must be used to remove air from the system:

**NOTE:** If air removal temporarily eliminates the problem, but it occurs again, you must fully check and test all fuel lines and connections. Loose fuel connections and gasket surfaces, or damaged fuel lines, can allow air to enter the system without showing any apparent leakage.

1. Remove the cover for the fuel injectors (Fig. 90). Refer to the Disassembly and assembly Manual.
2. Turn the key switch to the RUN position. Leave the key switch in the RUN position for three minutes.
3. Turn the key switch to the OFF position.

**NOTE:** Damage to the fuel injection pump, to the battery, and to the starter motor can occur if the starter motor is used excessively to purge the air from the fuel system.

4. Loosen the flare nuts (1) for the high pressure fuel lines on all of the fuel injectors.

**IMPORTANT: DO NOT** crank the engine continuously for more than 30 seconds. Allow the starting motor to cool for two minutes before cranking the engine again.

5. Observe the connection at the flare nut. Operate the starting motor and crank the engine until the fuel is free of air.

6. Tighten the flare nuts (1) to a torque of 30 Nm.
7. The engine is now ready to start. Operate the engine at low idle for a minimum of five minutes immediately after air has been removed from the fuel system.

**NOTE:** Running the engine for this period of time will help ensure that the pump is completely free of air.

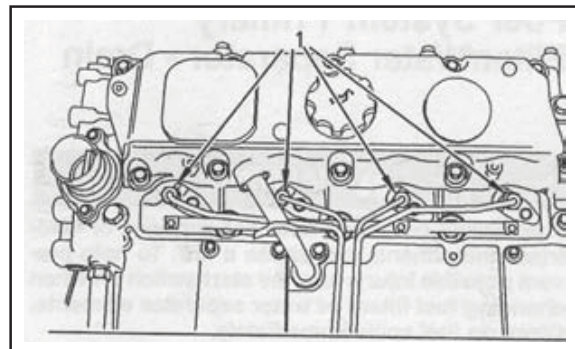


Fig. 90

## Valve tip clearances

The valve tip clearances should be checked by your Massey Ferguson Dealer every 1500 hours.



# Maintenance and Adjustment

## Air cleaner

Dry air cleaner (unloader valve)

Check the unloader valve - Flexible maintenance. If the tractor is not fitted with an air pre-cleaner check the unloader valve (1, Fig. 93). Squeeze the valve with the fingers to release the accumulated dust. Clean the MAIN element - Flexible maintenance or when the indicator light comes on.

Change the MAIN element every 1000 hours or sooner if it is determined unfit for service.



**CAUTION:** *Never use petrol (gasoline), paraffin or cleaning solvents to clean the elements.*

\***DO NOT** attempt to blow the main element clean using the tractor exhaust gases.

\***DO NOT** attempt to clean the inner secondary element.

\***NEVER** add oil to a dry air cleaner.

\*If servicing is not carried out when the indicator light comes on the engine will lose power and damage could be caused.

If the air cleaner indicator light comes on when the engine is running, stop the engine and service the air cleaner. To remove filter:

Pull open front grill and remove wing nut. Pivot filter housing out, filter can now be accessed for removal (Fig. 91-92)

1. Unscrew the central wing nut (Fig. 93) and withdraw the main outer element (2).

2. If dust is present inside the outer element, it must be renewed. If satisfactory, clean the element by tapping both ends on the palm of the hand (Fig. 94). **DO NOT** tap the element against a hard surface as it will become damaged or distorted.

3. Alternatively, to remove dust, compressed air (Fig. 95), not exceeding 7 bar (100 psi) may be used. Insert the air line nozzle inside the element and blow the dust from the inside to the outside. Blow loose particles from the outside of the element by holding the nozzle at least 300 mm (12 in) from the element. Protect your eyes when carrying out this operation.

4. Clean the inside of the air cleaner casing with a damp lint-free cloth and refit the outer element ensuring that the rubber sealing ring on the end is secure.

5. If the indicator light comes on after a very short interval of time, the main element is unfit for service and must be renewed. However, if after renewal of the main element, the indicator light stays on, the inner element must also be renewed - **DO NOT** attempt to clean it.

## Inner secondary element

Change every 1000 hours or every 12 months whichever is the sooner.

The inner filter element (3, Fig. 93) is added to protect the engine should harmful particles pass through the main filter. This inner element should be changed every 1000 hours. **DO NOT** attempt to clean the inner element.

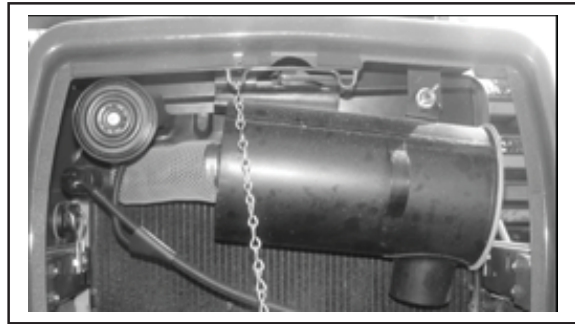


Fig. 91



Fig. 92

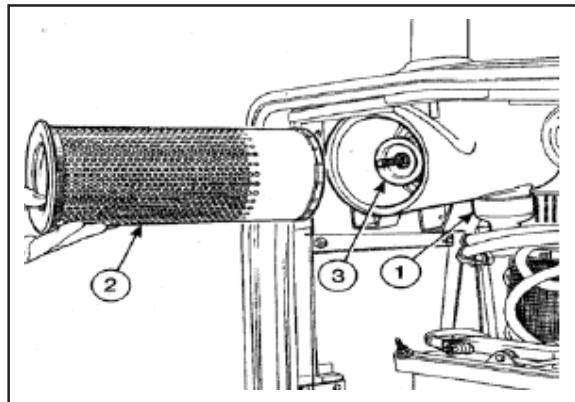


Fig. 93



Fig. 94

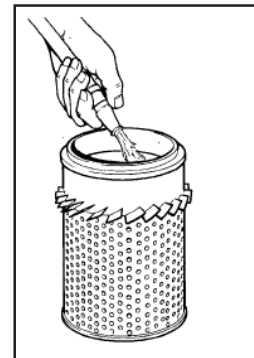


Fig. 95

# Maintenance and Adjustment

## Cooling system



**WARNING:** High-pressure steam and hot water. Remove the filler cap with extreme care. **DO NOT** check or fill while the engine is hot or running.

### Antifreeze:



**WARNING:** It is very important that you read the label on the container before you add antifreeze to the cooling system. The safety precautions are as follows:

- \* Keep locked up and out of reach of children.
- \* Keep only in the original container.
- \* Avoid contact with the skin and eyes.
- \* Wear suitable protective clothing and gloves.
- \* Harmful by inhalation and if swallowed.
- \* If swallowed, seek medical advice immediately and show the label or container.

### Coolant

Check the radiator coolant level - Flexible maintenance.

**DO NOT** use an antifreeze solution for more than two years (or 2000 hours) of operation. The heat generated by the diesel engine causes a natural change in the inhibitors in the coolant which results in loss of corrosion protection. The loss of the inhibitors may cause water pump cavitation and cylinder block erosion.

1. To check the coolant level first remove the radiator cap slowly to allow pressure to escape. **DO NOT** add cold coolant to a hot system.
2. The coolant level must be maintained at 25 mm (1 in) below the filler neck. Top up with antifreeze solution of the correct strength.

### **Drain the cooling system every 1000 hours or two years whichever is the sooner.**

1. To drain the cooling system remove the radiator cap slowly to allow any pressure to escape.
2. Remove the drain plugs at the bottom of the radiator and from the cylinder block (Fig. 96).
3. If the old coolant is very dirty, flush out the system with clean water.
4. Replace the plugs and reconnect the hose if removed. Refer to Specifications for cooling system capacities. The pre-mixing of water and antifreeze is preferred. Use clean water and a 50% antifreeze solution.
5. Run the engine for approximately five minutes to remove all air from the system.

**NOTE:** It is advisable to use Massey Ferguson antifreeze, it contains inhibitors to protect your engine

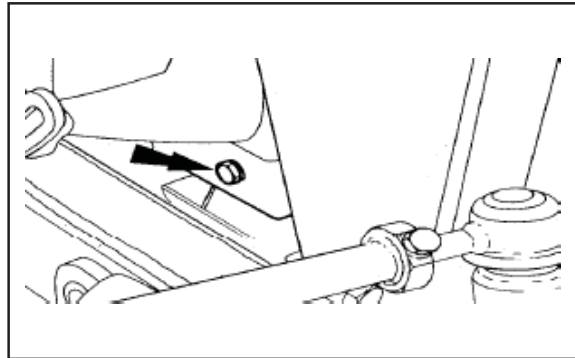


Fig. 96

### Frost precautions (cold climate)

Antifreeze solutions must be added to the cooling system water. Use Massey Ferguson Universal Antifreeze, available from your local Massey Ferguson Dealer. The correct proportion of coolant mixture is 50% water and 50% antifreeze.

**DO NOT** use more than 50% antifreeze solution in the cooling system unless the ambient air temperature will be less than -36°C (-31°F). More than 50% decreases heat transfer and will cause the engine temperature to be more than normal.

It should be remembered that an antifreeze solution not only prevents freezing, it also contains an anti-corrosion additive that protects the cooling system. The mixing of different makes of antifreeze can lead to the loss of corrosion protection and is therefore not recommended.

**IMPORTANT:** If an antifreeze solution is not used during freezing weather, the coolant must be drained after work to prevent damage from freezing. Use the procedure under draining the cooling system.



## Maintenance and Adjustment

### Radiator

*Check the radiator fins for blockage - Flexible maintenance.*

The radiator fins (Fig. 97) must be checked for blockage, they can be cleaned by blowing with compressed air or a high-pressure washer not exceeding 7 bar (100 psi). First remove the battery then clean from the rear of the radiator and remove the side panels to allow debris to escape. Fins blocked with oily substances may be cleaned with a detergent solution, preferably applied with a high pressure washer. Check the coolant level and add coolant if needed. Check the hoses, radiator, and pump for leaks

**NOTE:** It is advisable to use Massey Ferguson antifreeze, it contains inhibitors to protect your engine.

### Clutch

Main clutch adjustment

*Check the clutch adjustment every 100 hours.* When the tractor enters service, or has new clutch linings fitted, the clutch must be carefully bedded in. The clutch pedal linkage must be checked frequently during the first 50 hours and necessary adjustments made immediately. Subsequent checks must be made at 100 hour intervals.

*Procedure:*

1. Insert a solid bar in the hole at the end of the clutch operating shaft (1, Fig. 98) and rotate it clockwise until resistance is felt.
2. Slacken the clamp bolt (2) securing the arm to the shaft and set the distance between the lever (3) and the stop plate (4) to 4 mm (0.156 in). This will give a free pedal movement of 25 mm (1 in) at the pad.
3. Retighten the clamp bolt (2). Press the clutch pedal down through its full travel five times, recheck the free travel and readjust if necessary.

### Live PTO clutch

*Check the clutch setting every 1000 hours.*

**NOTE:** Tractors with IPTO and single plate clutches **DO NOT** require this adjustment.

Check the clutch adjustment more frequently if heavy PTO work has been involved.

1. Remove the four bolts and the inspection cover from the underside of the clutch housing (Fig. 99).
2. Unplug harness from the fuel shut-off solenoid, then rotate the engine until one of the three adjusters is visible in the inspection aperture.
3. With the aid of a feeler gauge, check the clearance 'A' between the bolt head and the clutch plate. It should be 1.8 mm (0.070 in).
4. If adjustment is required, slacken the nut and adjust the bolt to the correct clearance and retighten the nut.
5. Carry out the same procedure for the other two adjusters and replace the inspection cover.
6. Plug the harness for the fuel shut-off solenoid.

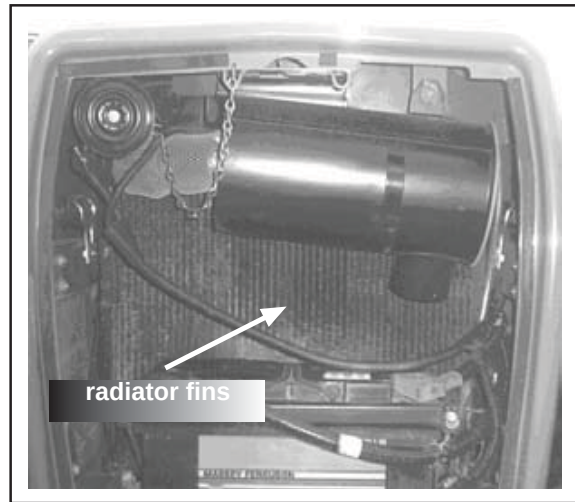


Fig. 97

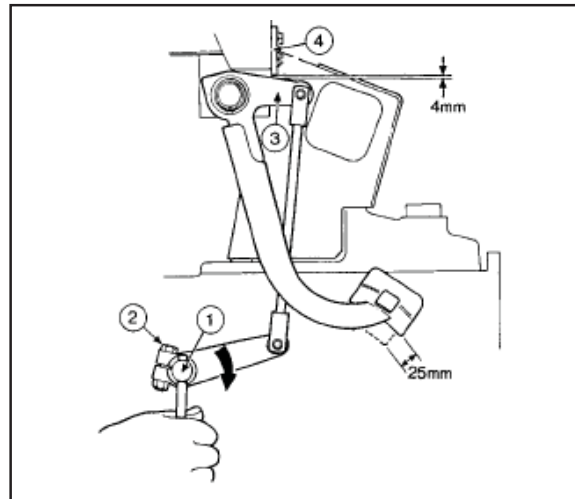


Fig. 98

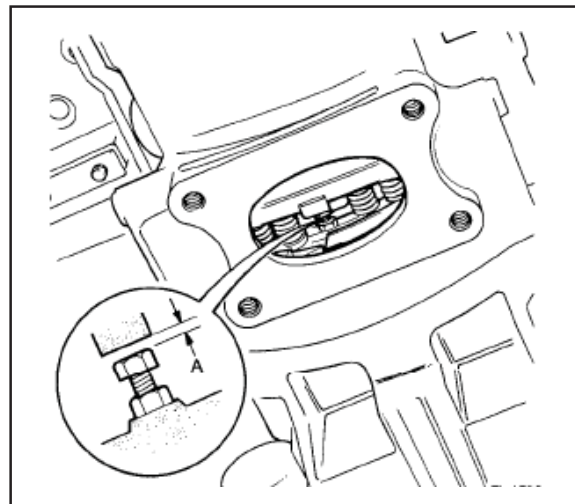


Fig. 99

# Maintenance and Adjustment

## Brakes

### Disc Brakes - MF 410/420/430

*Check the brakes every 250 hours, or more frequently if heavy work is involved.*

Procedure to adjust the brakes:

1. With the rear wheels attached, jack up the rear of the tractor and place it on axle stands with the wheels clear of the ground.
2. Slacken off the parking brake cable on the right-hand side of the tractor.
3. With the aid of an assistant, rotate one of the wheels slowly, at the same time tighten the adjuster nut (Fig. 100) until the wheel just locks. It is important to always rotate the wheel forwards.
4. The clearance is adjusted by unscrewing the adjuster nut a number of flats back-off related to the number of friction discs fitted to one side of the axle, see table below:

| Tractor model | No. of friction discs | No. of flats of nut back-off |
|---------------|-----------------------|------------------------------|
| 410/420/430   | 4                     | 9                            |

5. Carry out the same operation on the left-hand side of the tractor.
6. Tighten the parking brake cable.
7. Road test the tractor, and check the brakes for binding or pulling to one side. Any tendency to pull to one side should be counteracted by slackening off the adjuster nut on the side to which the tractor pulls.

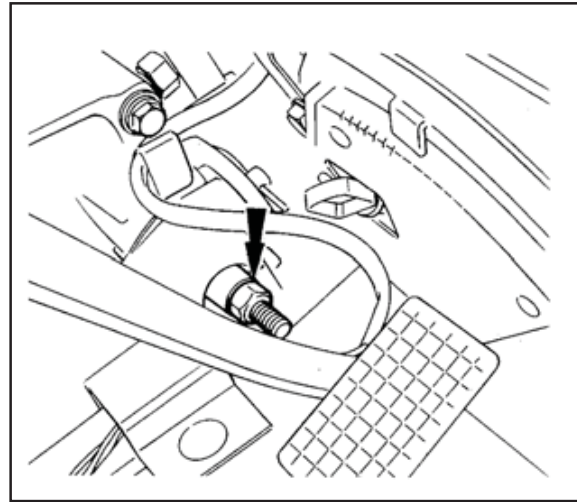


Fig.100

## Maintenance and Adjustment

### Parking brake

The parking brake should be fully applied when the parking brake lever is raised to the third or fourth notch (click) on the quadrant.

If adjustment is required, ensure that the rear brakes are correctly adjusted first. Then adjust the length of the brake cable by turning the adjuster (Fig. 101).



**CAUTION:** *If, after the full adjustment procedure, brake operation is unsatisfactory, notify your Massey Ferguson Dealer immediately.*

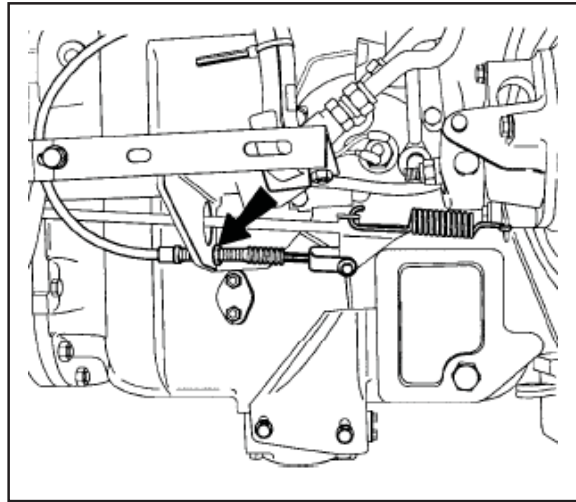


Fig.101

### Differential lock

Differential lock -

*Check the differential lock every 500 hours*  
1. Ensure that the pedal (1, Fig.103) operates freely throughout its complete travel.

2. Turn back the rubber seal (2) covering the actuator fork lock-nut.

3. Slacken the lock-nut.

4. Unscrew the fork (3) so that the foot pedal casting just contacts the mounting bracket at the position indicated by arrow.

5. Tighten the lock-nut and return the seal to its original position.

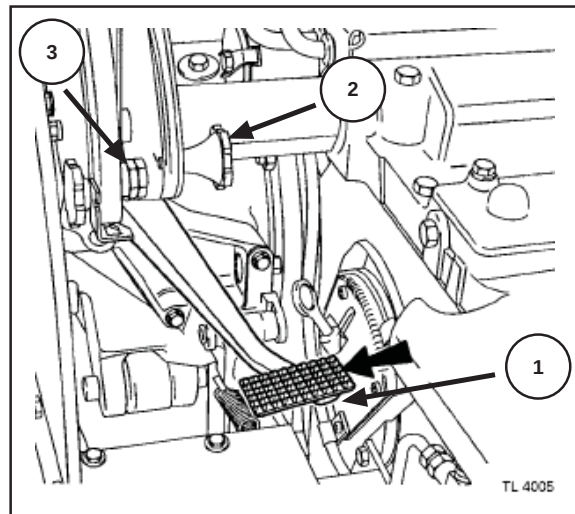


Fig.103

# Maintenance and Adjustment

## Transmission and hydraulics

### Oil level

*Check the transmission and hydraulic oil level every 100 hours.*

The oil level (Fig. 104) must be maintained between the 'MAX' and 'MIN' marks on the dipstick for normal use. When using auxiliary hydraulics with implements which require a large quantity of oil or when working on hillsides or sloping land, ensure that the transmission oil level is maintained at the 'MAX' mark on the dipstick.

*To check the oil level:*

1. Move the tractor onto level ground.
2. Stop the engine.
3. Pull out or unscrew the dipstick and check the oil level.
4. If necessary, remove the filler plug and add oil to the correct level (Fig. 104).

### Transmission/hydraulic oil

*Change the transmission/hydraulic oil every 1000 hours.*

1. Move the tractor to level ground.
2. Place a suitable container beneath each drain plug.
3. Remove the two drain plugs (Fig. 105).

**NOTE:** When an optional creeper gearbox is fitted there is an additional drain plug under the creeper housing which must also be drained.

4. Place the hydraulic control lever(s) in the fully 'DOWN' position.
5. Remove, clean and refit the oil strainer.
6. Refit the drain plugs. Then refill the system through the transmission oil filler (Fig. 106) to the required level, with an approved oil.
7. After allowing time for the oil to settle, check the level of the oil, then, if necessary, add further oil and refit the filler plug.

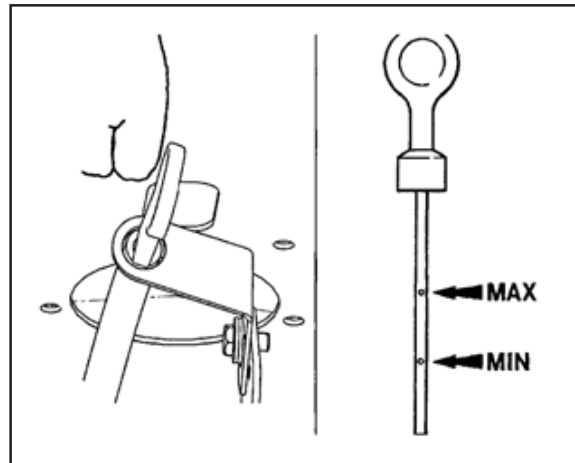


Fig.104

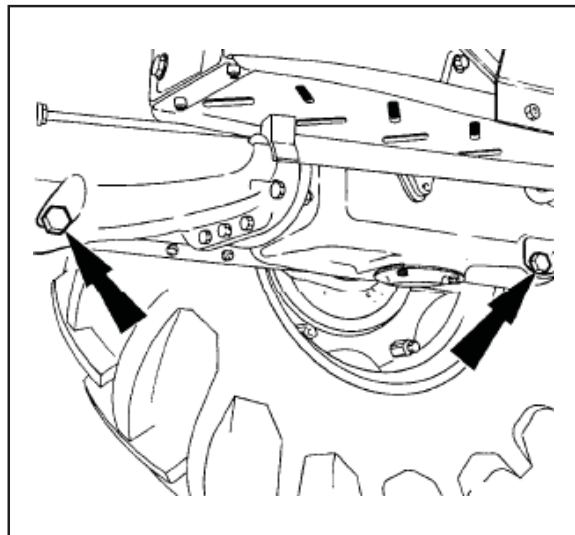


Fig.105



Fig.106

# Maintenance and Adjustment

## Linkage pump oil strainer

*Clean the linkage pump oil strainer at first 50 hours then 1000 hours thereafter.*

1. Drain the oil by removing the two drain plugs (Fig. 107) as described on previous page.
2. Remove the three bolts (2, Fig. 107) and washers securing the cover plate (3) to the bottom of the center housing.
3. Remove the clip (5), nut (6), spring (7), washer (8) and 'O' ring (9).
4. Pull out the strainer (10).
5. Thoroughly clean the strainer with a paint brush and a container of solvent. Remove all particles of debris from the folds of the strainer material.
6. Carry out an inspection of the strainer material, discard and replace the strainer if any damage is detected.
7. Check that the strainer stud (11) is tight in the pump housing.
8. Check that the 'O' ring is seated in the pump, then refit the strainer (10).
9. Refit the 'O' ring (9), washer (8), spring (7), nut (6) and the clip (5).
10. Using a new gasket (4), refit the cover plate (3), with the three bolts (2) and washers.
11. Refit the two drain plugs.
12. Refill the transmission (Fig. 106) with an approved oil.

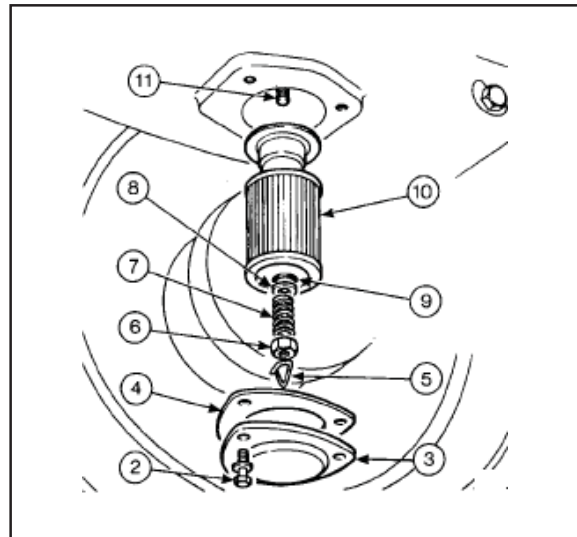


Fig.107

## Auxiliary pump oil strainer

*Clean the auxiliary pump oil strainer at first 50 hours then 1000 hours thereafter.*

1. If not changing the transmission oil and to avoid oil spillage when removing the oil strainer, drain off 10 liters (2.6 US gal.) of oil through the drain plugs or position the tractor so that the front is facing downhill.
2. Remove the four nuts securing the cover plate to the strainer body (1, Fig. 108).
3. Remove the cover plate (4) which has a spring attached to the inside.
4. Pull out the strainer (2).
5. Thoroughly clean the strainer in solvent with a suitable brush. Remove all particles of debris from the screen of the filter.
6. Carry out an inspection of the filter material, discard and replace the strainer if any damage is detected.
7. Refit the strainer.
8. Check that the gasket (3) is in good condition otherwise fit a new one.
9. Refit the cover plate with the four nuts, tighten securely.
10. Refit the two drain plugs.

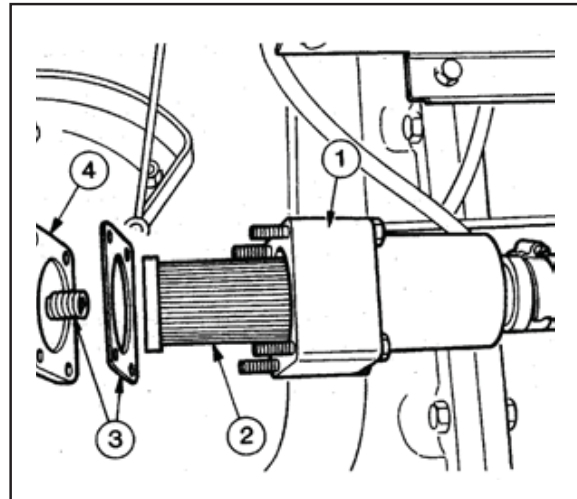


Fig.108



## Maintenance and Adjustment

### Tandem Pump Oil Filter

Replace the tandem pump oil filter element at first 50 hours then 250 hours thereafter or when the blockage indicator light comes on.

1. Unscrew and discard the canister (1, Fig 109)
2. Smear a few drops of clean hydraulic oil on the sealing ring (2) of a new canister.
3. Screw the new canister on until the sealing ring just contacts the filter head (3), then tighten a further half-turn by hand only. **DO NOT** overtighten.

**NOTE:** After changing the oil and filter, run the engine and check for leaks, then check the transmission dipstick oil level and if necessary, top up.

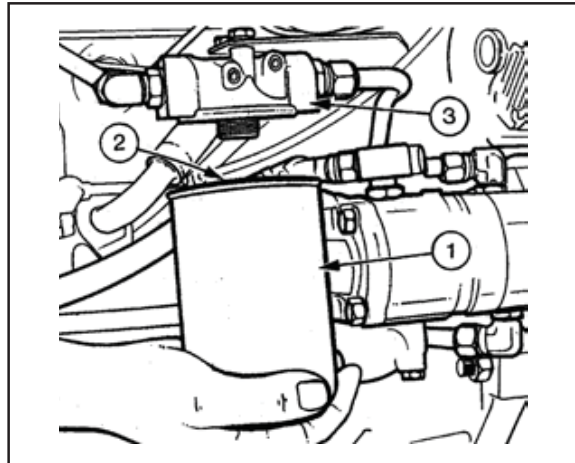


Fig.109

### Front axle

Front wheel hubs

Check the front wheel hub adjustment every 500 hours.

If the front hub requires adjustment, proceed as follows:

1. Raise the wheel off the ground and remove the hub cap.
2. Remove the split pin (1, Fig. 110) and tighten the castellated nut (2) to a torque of 80 Nm (60 lbf ft), then slacken off the nut to the nearest pin hole to give the correct end play. Fit a new split pin.
3. Refit the hub cap. Grease the hub until clean grease comes out past the seals at the back of the wheel.

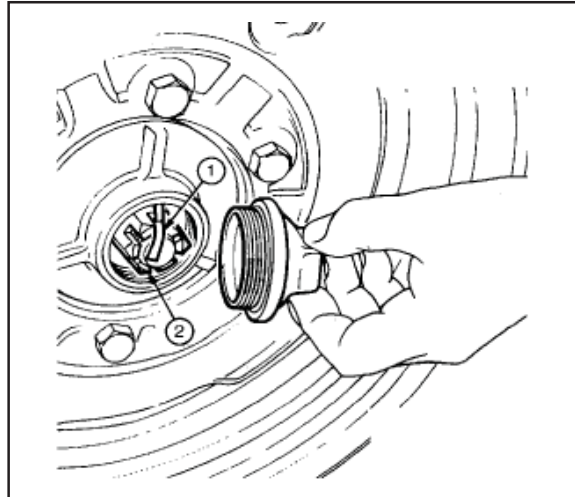


Fig.110

### Front wheel alignment

Check the front wheel alignment every 1000 hours.

1. Drive the tractor onto firm level ground and put the front wheels in the straight ahead position.
2. Check the wheel toe-in (Fig. 111) measured on the center of the axle at the wheel rim. Distance A must be 0-4 mm (0-0.156 in) greater than distance B.
3. Drive the tractor forward for half of a front wheel revolution. Check distance A again.

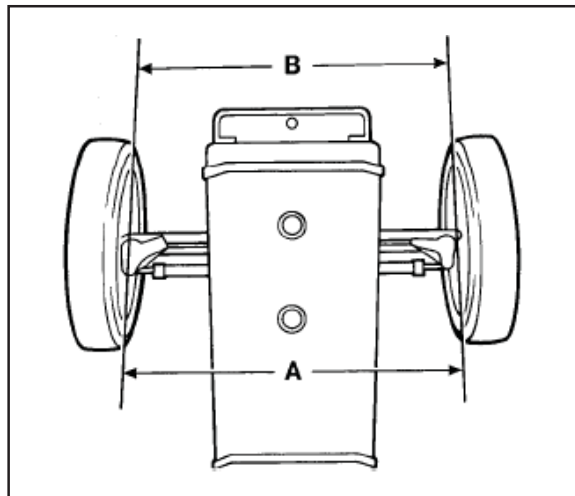


Fig.111

## Maintenance and Adjustment

*Adjustment (two wheel drive) Check every 1000 hours.*

1. If adjustment is necessary, loosen both ball joint locking nuts (1, Fig. 112).
2. Remove both pinch bolts (2) from each end of the steering cylinder.
3. Rotate the track rod on both sides by only one turn each time. Screwing out the track rod will increase the toe-in, screwing in will decrease the toe-in.
4. Refit the nuts and bolts (2) to the end of the steering cylinder and tighten to a torque of 85 Nm (63 lbf-ft).
5. Check the toe-in, if the measurement is now acceptable, set the bolt (2) in horizontal position, tighten the two ball joint locking nuts (1) to a torque of 260 Nm (192 lbf-ft) on each end of the track rod.



**CAUTION:** *The amount of track rod screwed into each ball joint must be equal on both sides of the tractor.*  
\* The bolts securing the track rod to the steering ram must be in the horizontal position.

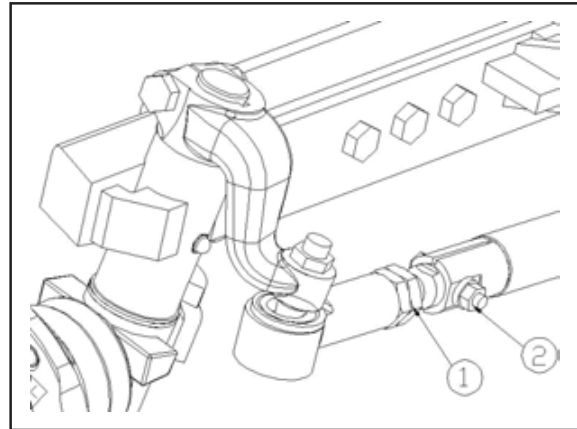


Fig.112

*Adjustment (four wheel drive) Check every 1000 hours.*

1. Loosen the lock-nut (1, Fig 113) on the track rod on one side only.
2. Rotate the inner steering ball joint (2) to either increase or decrease the track rod length to obtain the correct setting.
3. Tighten the track rod lock-nut to a torque of 112 Nm (83 lbf-ft). Ensure that both track rods are the same length.

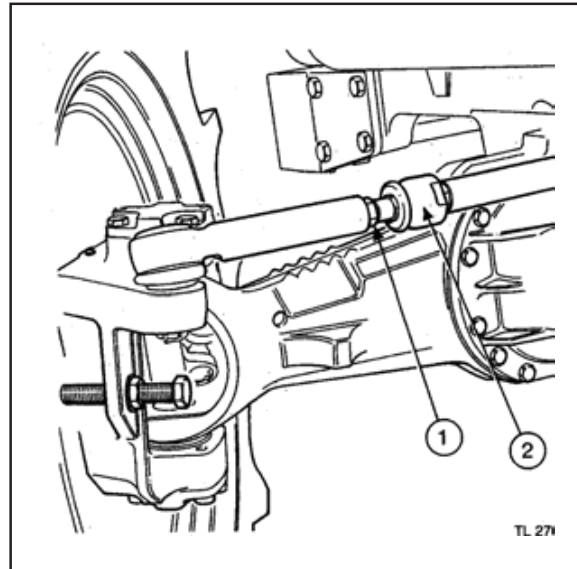


Fig.113

# Maintenance and Adjustment

## Front track adjustment (two-wheel drive)

**NOTE:** The maximum track position is for light work only. Do not use when operating a front end loader.

The front wheel track is adjustable (See Fig.115).

Adjustment is as follows:

1. Raise the front wheels clear of the ground.
2. Remove the bolts and nuts (1, Fig.114) each side.
3. Remove the tie rod bolts (2) each side.
4. Slide the axle arms and the tie rods to the required track setting.
5. Refit the six bolts and nuts (1) through the appropriate axle beam holes and the tie rod bolts (2) similarly.
6. Tighten the axle beam nuts to a torque of 200 Nm (148 lbf-ft).
7. Tighten the tie rod bolts to a torque of 85 Nm (63 lbf-ft)
8. Check the front wheel alignment, see page (76-77)

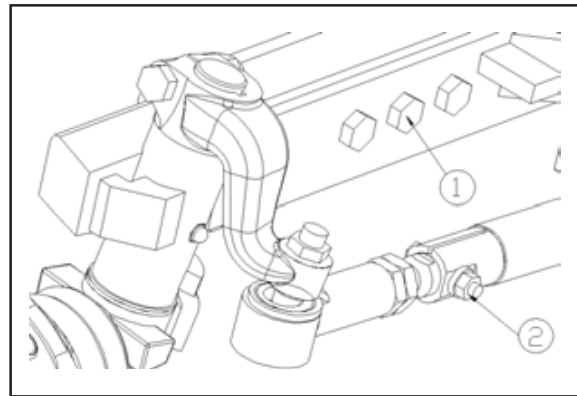


Fig.114

|  | WITH<br>6.00X16<br>WHEEL | WITH<br>8LBX15- 15<br>WHEEL |
|--|--------------------------|-----------------------------|
|  | 1227<br>(48 in)          | 1384<br>(54 in)             |
|  | 1328<br>(52 in)          | 1485<br>(58 in)             |
|  | 1430<br>(56 in)          | 1586<br>(62 in)             |
|  | 1532<br>(60 in)          | 1687<br>(66 in)             |

Fig.115

# Maintenance and Adjustment

## Front track adjustment (four-wheel drive)

**NOTE:** The following instructions are for wheels that have a detachable rim and disc.

The different track widths are obtained by altering the position of the rim in relation to the disc or by reversing the wheels.

If the wheels are reversed, they must be transferred to the opposite side of the tractor so as to maintain the correct tire tread direction.

Adjustment is as follows:

1. Select the required track setting. See Fig. 116 opposite.
2. Slightly slacken either the wheel to axle, or the rim to disc nuts, or both according to the requirements.
3. Using a jack, raise the front wheels just clear of the ground and support on an axle stand.
4. Remove the rim from the disc, or the complete wheel, or both and reassemble them with the rim and disc in their new positions.
5. Oil the bolts or studs threads before fitting the nuts, then tighten to a torque of:
 

|                  |                        |
|------------------|------------------------|
| Disc to axle hub | - 270 Nm (200 lbf ft.) |
| Rim to disc      | - 190 Nm (140 lbf ft.) |

**IMPORTANT:** At the smaller track setting, a foul condition may occur between the tire and the tractor or loader, if fitted, when the wheels are turned to the full lock position.

To avoid this condition you must check by turning the wheels to full lock, swinging the axle onto both bump stops both sides, and adjusting the steering stops as necessary.

## Steering stop adjustment

1. Place the jack under the engine sump and raise the tractor enough to allow the axle to swing from one stop to the other.
2. Turn the front wheels to full lock and check that the inside edge of the tire does not foul the tractor.
3. Carry out the same check on the other lock.
4. If necessary, adjust the steering stops (1, Fig 117) on both sides so that a foul condition will not occur. Tighten the lock-nuts (2) after adjustment.



**CAUTION:** Recheck the nut and bolt tightness after 10 hours (2 hours if on loader work) re-tighten twice more at 10-hour intervals. This protects against the loosening that occurs from assemblies settling down.

## 4 WD FRONT TRACK WIDTHS WITH 20 INCH WHEELS

|  |                 |
|--|-----------------|
|  | 1118<br>(44 in) |
|  | 1227<br>(48 in) |
|  | 1320<br>(52 in) |
|  | 1429<br>(56 in) |
|  | 1520<br>(60 in) |
|  | 1629<br>(64 in) |

Fig.116

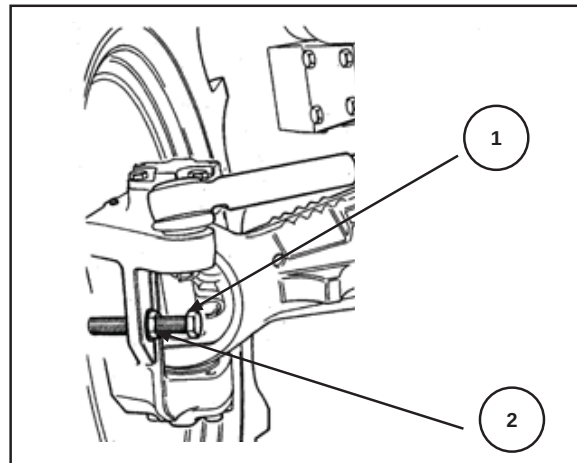


Fig.117

# Maintenance and Adjustment

## Front axle adjustment (For MF 430 4WD tractor only)

### Toe-in adjustment

20.11 SD model front axle with a limited slip differential type is mounted on MF 430 4WD tractors.

Put two equal one-meter-long linear bars on the wheel sides and lock them with two nuts on the wheel hub stud bolt. (Fig. 118)

**Note:** The two bars should be fixed on their middle so that they are perpendicular to the supporting surface and parallel to the pinion shaft axis; align the two bars.

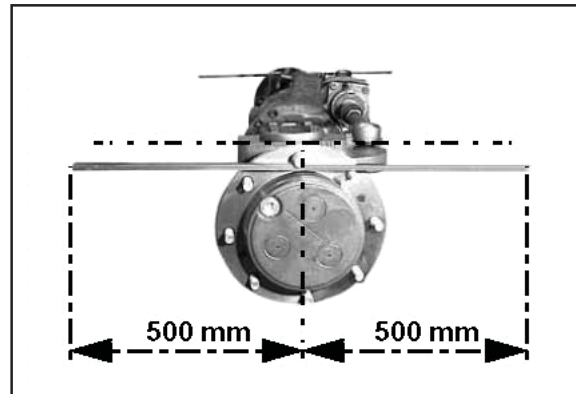


Fig.118

Measure the distance in mm M between the bars ends with a tapeline.

Note: Keep the minimum value, swinging the measurement point.

Check that the difference of the measurements between the wheel hubs diameters ends is within the requested tolerance range.

The nominal toe-in value (A) is referred to the external diameter of the wheel hubs flange, therefore the measured value (M) at the bars ends must be related to the ratio between length of the bar and flange diameter (Fig. 119).

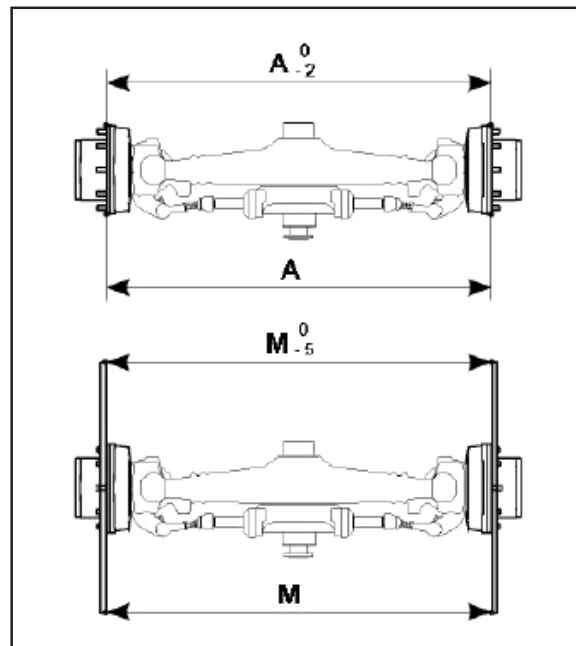


Fig.119

If toe-in is incorrect, operate with two wrenches on the guide rods (1) screwing in and out the two joint tie rods (3) equally till the toe-in is within the requested tolerance. After adjusting, screw in the lock nuts (2) of the guide rods (1) to the requested tightening torque (Fig. 120).

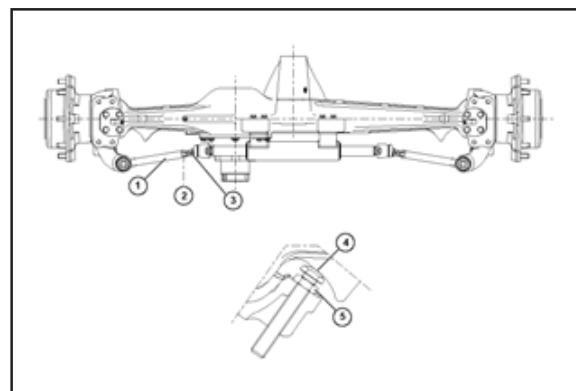


Fig.120



## Maintenance and Adjustment

### Steering angle adjustment

Use the same bars assembled for the toe-in adjustment and a long bar perfectly leaned over the machined part of the central body (pinion side), so that the two bars form an acute angle at the maximum steering. (Fig. 121).

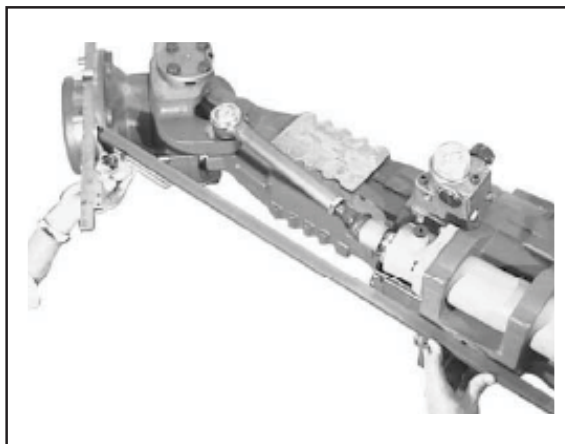


Fig.121

Adjust a protractor to the requested angle ( $55^\circ \pm 0-2^\circ$ ) and position it on the long bar. (Fig. 122) Move a wheel side till it forms, with the two bars, the angle fixed by the protractor. Adjust the mechanical steering stop, screwing in or out the stop bolt (Fig 120), locking it with the locknut (5) to 150 Nm torque.



Fig.122

Steer completely towards the other side and repeat the same operations. (Fig. 123).

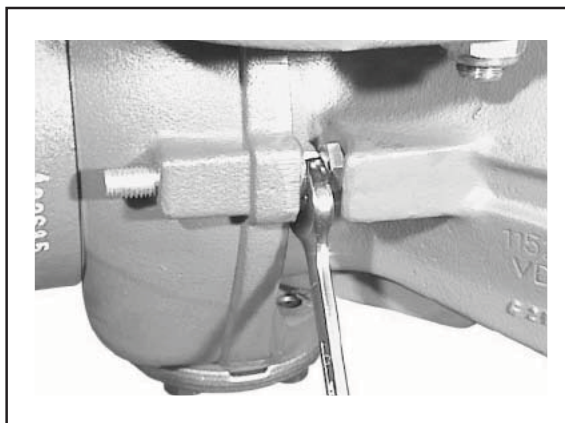


Fig.123

# Maintenance and Adjustment

## Oil change and checks

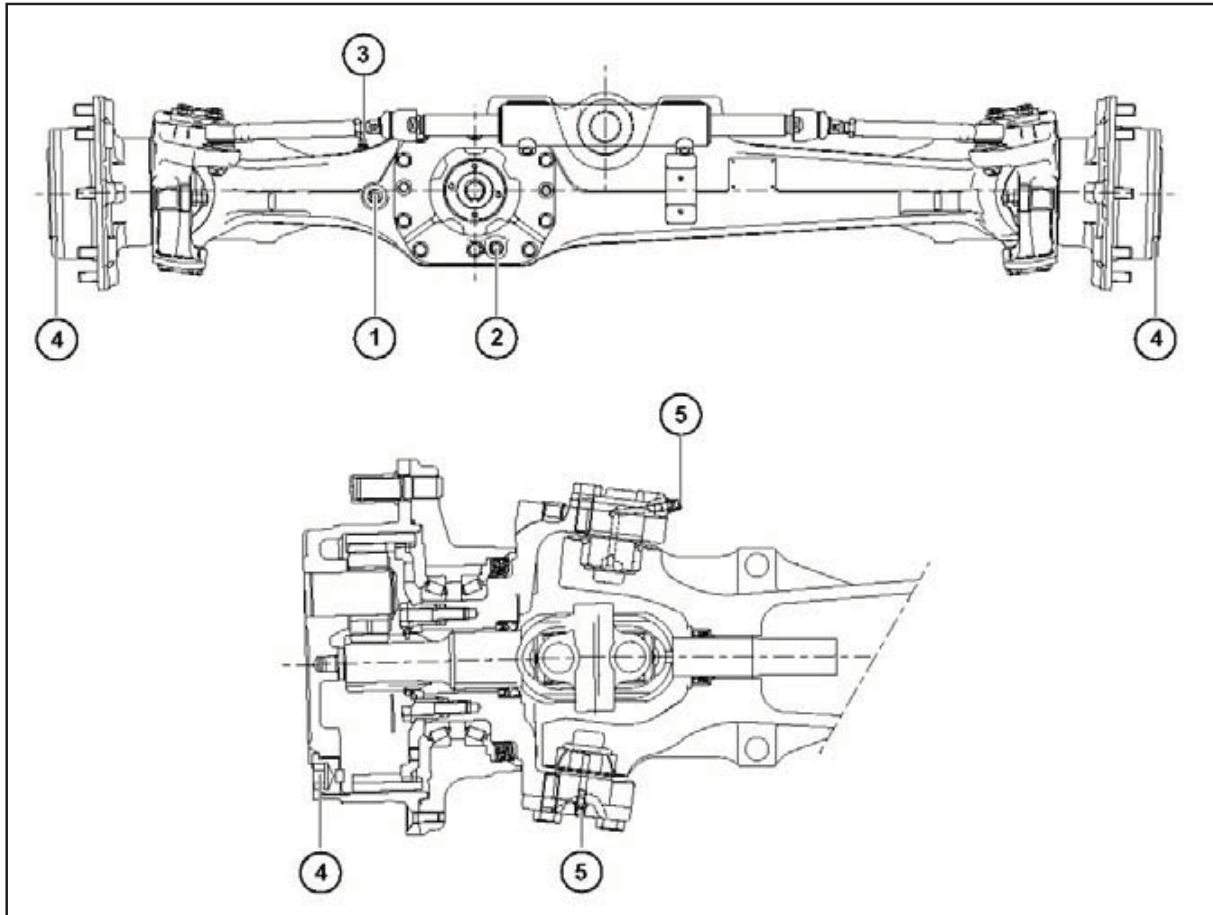


Fig.124

| <i>DESCRIPTION</i>                                            | <i>POSITION</i> |
|---------------------------------------------------------------|-----------------|
| Oil filling and level plug                                    | 1               |
| Oil drain plug                                                | 2               |
| Oil breather                                                  | 3               |
| Filling, drain and level plug of epicyclic reduction gear oil | 4               |
| Greasing points                                               | 5               |

# Maintenance and Adjustment



**Warning:** To drain and fill the oil and to check the oil level the axle must be horizontal.

Before draining the oil from axle housing, use the breather (3) to release possible internal pressure. (Fig. 125)

To drain the oil remove the level plug (1) and the drain plug (2). Drain all oil.

Clean the plug (2) and tighten it to 70 Nm torque. Always use the breather (3) to release possible internal pressure.

Unscrew the oil fill plug (1) and fill to the bottom of the level plug hole with the specified oil. Wait to allow the oil to flow through the axle. Check oil level and fill to the specified level if necessary.

Screw the plug (1) to 75 Nm torque .

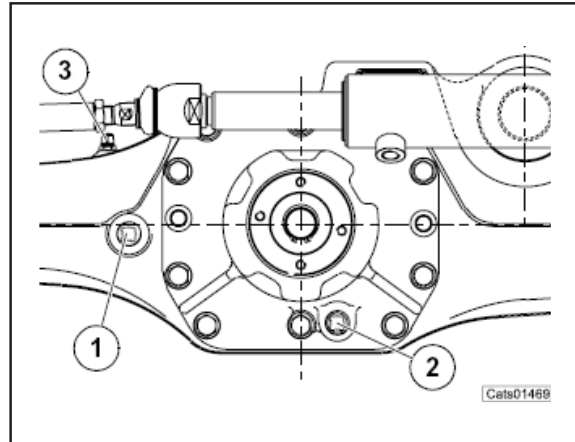


Fig.125

Before draining the oil from wheel end rotate the wheel end so that the plug (4) is at the highest position [pos.A] and partially unscrew to release possible pressure.

Rotate the wheel end so that the plug (4) is toward the ground [pos.B].

Remove the plug and drain the oil. (Fig. 126)

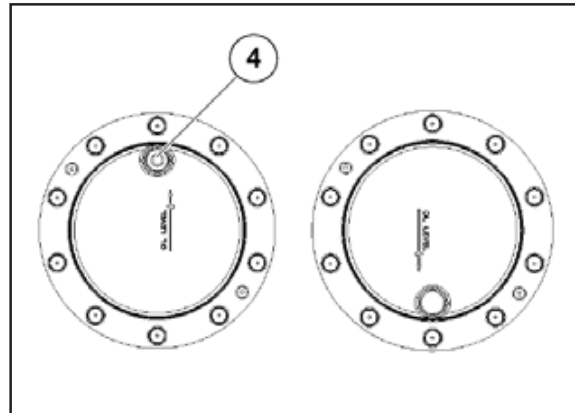


Fig.126

## 20.11 SD MF 430 4WD Front axle specifications

| DESCRIPTION                                     | VALUE                |
|-------------------------------------------------|----------------------|
| Steering angle                                  | 0<br>55° - 2         |
| Toe-in                                          | 0<br>A° - 2          |
| Differential oil capacity                       | 5.5 litres           |
| Epicyclic reduction gear oil capacity each side | 0.6 litres           |
| Oil specification:                              | API GL4<br>MIL L2105 |
| Pinion-driveshaft interface Ø= 100 mm           | SAE 1310             |

# Maintenance and Adjustment

## Rear track adjustment - pressed steel wheels



**WARNING: When changing, repairing or transferring wheels observe the following precautions:**

- \*Use a jack that has adequate capacity to lift your tractor and is in good repair.
- \*Ensure that both the tractor and jack are on firm level ground.
- \*Use axle stands or other suitable blocking to support the tractor at all times when changing wheels and tires.
- \*Never use concrete blocks, bricks or old rotted timbers for support. They can collapse - even under light loads.
- \*DO NOT put any part of your body under the tractor or start the engine while the tractor is on the jack.
- \*Tractor wheels are heavy, handle with care and ensure, when stored, that they cannot topple and cause injury.
- \*Where tires with liquid ballast are used, a crane may be required to maneuver the wheels, due to their considerable weight.

The different track widths are obtained by altering the position of the rim in relation to the disc, or by reversing the wheels and transferring them from one side of the tractor to the other (Fig. 127). Adjustment is as follows:

1. Select the required track settings
2. Slightly slacken either the wheel to axle, or the rim to disc nuts, or both according to requirements.
3. Using a jack capable of lifting 1500 kg (3300 lb) raise the rear wheels just clear of the ground.

**NOTE:** If the wheels are reversed, they must be transferred to the opposite side of the tractor so as to maintain the correct tire tread direction.

4. Remove the rim from the disc or the complete wheel, or both and assemble them with the rim and disc in their new positions.

Disc to Axle Hub - 325 Nm (240 lbf ft).  
Rim to Disc - 240 Nm (177 lbf ft).

**IMPORTANT:** Recheck the wheel nut and rim bolt torques after 10 hours (or 2 hours if on loader work) and then recheck, and if necessary, re-tighten twice more at ten-hourly intervals. This protects against the loosening that occurs from assemblies settling.

Track settings below 1328 mm (52 in) may not be obtainable due to insufficient clearance between wheel and inside of fender. Minimum track setting cannot be obtained on tractors fitted with wide tires.

|                                                                                     | W11X28<br>WHEEL   | W12X24<br>WHEEL   | W11X28<br>WHEEL   |
|-------------------------------------------------------------------------------------|-------------------|-------------------|-------------------|
|    | 1223              | 1288<br>(default) | 1201              |
|    | 1434              | 1376              | 1413              |
|    | 1333<br>(default) | 1394              | 1309<br>(default) |
|    | 1545              | 1564              | 1520              |
|    | 1630              | 1607              | 1501              |
|    | 1841              | 1776              | 1830              |
|   | 1741              | 1694              | 1726              |
|  | 1951              | 1882              | 1938              |

Fig.127

## Maintenance and Adjustment

### Wheel weights

Wheel weights are available for the rear wheels, consult with your local Massey Ferguson Dealer for the correct weights for your tractor. Only sufficient weight should be added to provide traction and stability. Adding more weight than necessary results in excessive loads being imposed on the tractor and a higher fuel consumption.

Ensure that an equal amount of weights are fitted to each side of the tractor. When adding weight, adhere to the maximum tire capacity loading. The tire pressures will have to be increased to accommodate the additional weight. Consult with your Massey Ferguson Dealer or tire supplier to ensure that the loadings are not exceeded.

### Rear wheel weights

Rear wheel weights (Fig. 128) are bolted to the outside of the wheel. Additional weights can be bolted to the first adaptor weight. Each weight weighs approximately 45 kg (100 lb). When fitting the first adaptor weight, ensure that the cutout in the weight aligns with the tire valve for accessibility.

Tighten the weight bolts to a torque of 80 Nm (60 lbf ft).

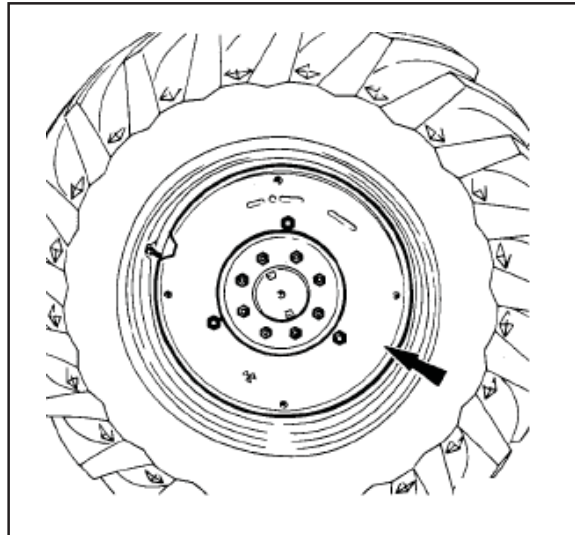


Fig.128



# Maintenance and Adjustment

## Tires

Check tire pressures every 100 hours or every two weeks whichever is the sooner.



**WARNING: Tire tread and ply rating or load index must match across the axle. Do not fit a radial one side and a crossply on the other. Check that the tire pressures are correct for the particular operation to be performed. These simple rules, if followed carefully, will ensure maximum tire life.**

Check and adjust the front and rear tire pressures and inspect the tread and side walls for damage. Check the pressure when the tires are cold (Fig.129). The correct pressure for any tire on the tractor is found by weighing the loaded axle and then referring to the load/inflation tables for that tire (see page 109).

**NOTE:** If the tires are ballasted with calcium chloride and/or water solution, a special tire gauge should be used as the solution will corrode the standard type of gauge.

1. The tire pressures listed, can be used without danger of sidewall rippling. In certain conditions the pressures may be lowered, where the loads are light. Higher tire pressures should be used for hillside plowing or if the tractor is to be used on the road for a length of time. **DO NOT** exceed the maximum recommended pressures.
2. Keep oil, grease and strong alkaline or acid fertilizers away from tires to prevent deterioration of the rubber.
3. Have any small sidewall or tread splits or cuts revulcanized as soon after they occur as possible. This extends the life of the tire.
4. If bolt-on weights are fitted, raise the pressures to suit the weight fitted, consult your Massey Ferguson Dealer.
5. Water ballasting details are quoted (see page 90) for a few of the many tire options available for these tractors. These figures are given as a guide only. For specific details for your tractor if not shown, or if you wish to change the tire sizes, see your Massey Ferguson Dealer who will have full tire range specifications and recommended pressures supplied by the tire manufacturers.

If you are unable to weigh the tractor axles to determine the correct tire inflation pressures the following guideline pressures can be used on firm surface conditions with correctly ballasted tractors.

|       | Mounted equipment | Trailed equipment | Transport        |
|-------|-------------------|-------------------|------------------|
| Front | 1.0 bar (15 psi)  | 1.0 bar (15 psi)  | 1.0 bar (15 psi) |
| Rear  | 1.6 bar (23 psi)  | 1.0 bar (15 psi)  | 1.6 bar (23 psi) |

Table 7

For front IMPLEMENT applications, front tire pressures should be increased to 1,6 bar (23 psi). For front LOADER application only, front tire pressures should be increased to 2,0 bar (30 psi).

**NOTE:** Note for exact inflation pressure requirement, axle loads need to be measured and the load/inflation tables need to be applied.

\*For hillside operation, **DO NOT** use inflation pressures lower than 1 bar (15 psi).

\*A correctly inflated radial tire under full load should have a profile as shown (Fig. 116).

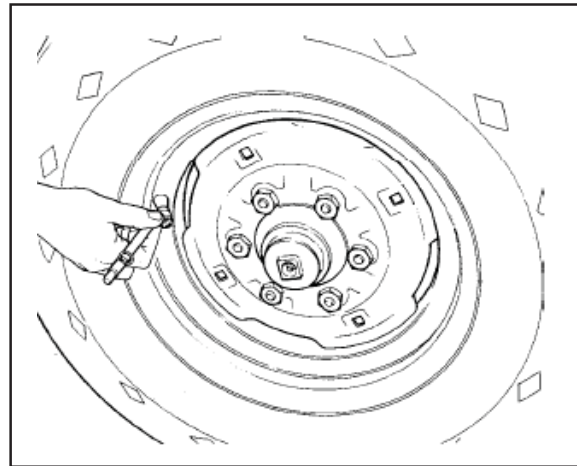


Fig.129

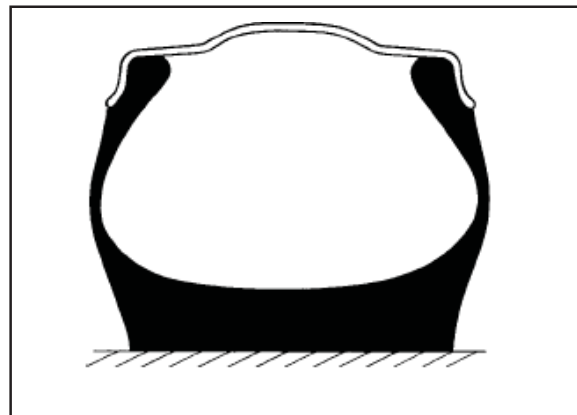


Fig.130

# Maintenance and Adjustment

## Cross-ply tires

The term 'cross-ply tires' applies to tires with bias or diagonal ply fitted to the front two-wheel drive axle or rear driven wheels. If you are unable to weigh the tractor axles to determine the correct tire inflation pressures, the following method can be adopted on firm surface conditions with correctly ballasted tractors. In the case of cross-ply tires the procedure is to check the size and ply rating and refer to load/inflation charts. For the relevant size read across the chart to the figure in brackets for the relevant ply rating - the inflation pressure indicated in the column heading is the maximum permissible and should be applied in cases where it is not possible to weigh the axle.

For LOADER application only, front tire pressures should be increased by 25%. A correctly inflated cross-ply tire under full load should have the profile shown in Fig. 130.

## Load index and speed symbols

In the past the 'tire load capacity category' was indicated by a PR (Ply Rating) number. This is an indicator of the tire's carcass strength. Now a code number is used giving the exact designation of the load capacity; this is referred to as the Load Index or LI for short.

In addition to the load index, Speed Index (SI) is used to designate the 'Speed Category' of the tire. These two figures will indicate the maximum load that can be carried by the tire at a prescribed speed. Understanding the information on the tire side wall is important. The illustration (Fig. 131) shows a radial tire.

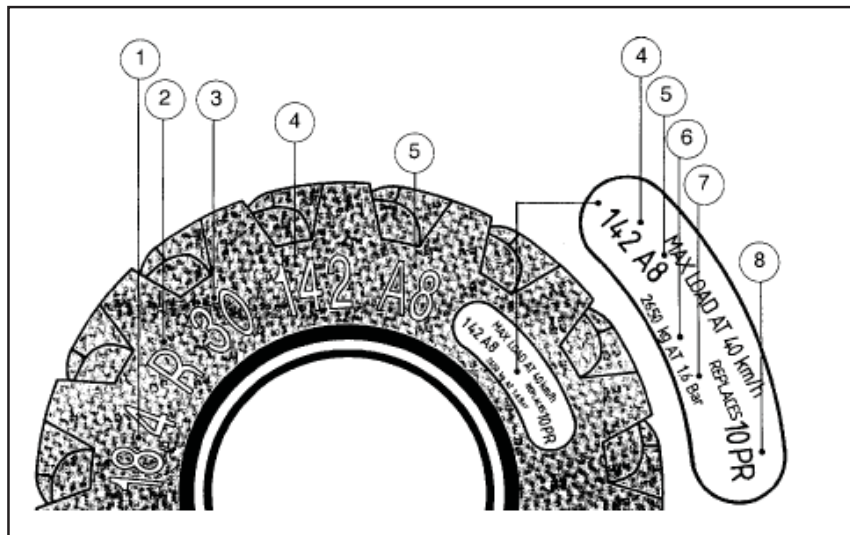


Fig.131

Key to Fig. 131.

1. Section width in inches.
2. Radial construction.
3. Rim diameter in inches.
4. Load diameter in inches.
5. Load Index. (Table 8 on page 88)
6. Speed Symbol, A8 = 40 Km/h.(Table9 on page 88)
7. Maximum inflation pressure.
8. Old marking (ply rating).

Example: A single tire with a marking of 18.4 R 30 142 A8 is 18.4 inch wide radial on a 30 inch wheel, maximum load capacity 2650 kg (5830 lbs) per wheel, 5300 kg (11660 lbs) per axle, maximum speed 40km/hour.

# Maintenance and Adjustment

For more detailed information on recommended loads speeds for agricultural tires, consult with your local Load Index Table (Table 8).

| LI  | kg (lb)     | LI  | kg (lb)      |
|-----|-------------|-----|--------------|
| 107 | 975 (2145)  | 122 | 1500 (3300)  |
| 108 | 1000 (2200) | 123 | 1550 (3410)  |
| 109 | 1030 (2266) | 124 | 1600 (3520)  |
| 110 | 1060 (2332) | 125 | 1650 (3630)  |
| 111 | 1090 (2398) | 126 | 1700 (3740)  |
| 112 | 1120 (2464) | 127 | 1750 (3850)  |
| 113 | 1150 (2530) | 128 | 1800 (3960)  |
| 114 | 1180 (2596) | 129 | 1850 (4070)  |
| 115 | 1215 (2673) | 130 | 1900 (4180)  |
| 116 | 1250 (2750) | 131 | 1950 (4290)  |
| 117 | 1285 (2827) | 132 | 2000 (4400)  |
| 118 | 1320 (2904) | 133 | 2060 (4532)  |
| 119 | 1360 (2992) | 134 | 2120 (4664)  |
| 120 | 1400 (3080) | 135 | 2180 (4796)  |
| 121 | 1450 (3190) | 136 | 2240 (4928)  |
| 137 | 2300 (5060) | 153 | 3650 (8030)  |
| 138 | 2360 (5192) | 154 | 3750 (8290)  |
| 139 | 2430 (5346) | 155 | 3875 (8525)  |
| 140 | 2500 (5500) | 156 | 4000 (8800)  |
| 141 | 2575 (5665) | 157 | 4125 (9075)  |
| 142 | 2650 (5830) | 158 | 4250 (9350)  |
| 143 | 2725 (5995) | 159 | 4375 (9625)  |
| 144 | 2800 (6160) | 160 | 4500 (9900)  |
| 145 | 2900 (6380) | 161 | 4625 (10175) |
| 146 | 3000 (6600) | 162 | 4750 (10450) |
| 147 | 3075 (6765) | 163 | 4875 (10725) |
| 148 | 3150 (6930) | 164 | 5000 (11000) |
| 149 | 3250 (7150) | 165 | 5150 (11330) |
| 150 | 3350 (7370) | 166 | 5300 (11660) |
| 151 | 3450 (7590) | 167 | 5450 (11990) |
| 152 | 3550 (7810) | 168 | 5600 (12320) |

Table 8

Speed Index Table (S1)

| Symbol | Speed<br>km/h(mph) | Symbol | Speed<br>km/h(mph) |
|--------|--------------------|--------|--------------------|
| A1     | 5 (3.1)            | A6     | 30 (18.6)          |
| A2     | 10 (6.2)           | A7     | 35 (21.8)          |
| A3     | 15 (9.3)           | A8     | 40 (24.8)          |
| A4     | 20 (12.4)          | B      | 50 (31.0)          |
| A5     | 25 (15.5)          | C      | 60 (37.2)          |

Table 9 - The Speed Symbol (S1) indicates the speed which a tire can carry the load corresponding with its load index under service conditions.

Table 8 - The load index (L1) is a numerical code associated with the maximum load a single tire can carry the speed indicated by its speed symbol under specified service conditions.

## Maintenance and Adjustment

### Service tires safely



**DANGER:** Failure to follow the correct procedure when fitting a tire on a wheel or rim can produce an explosion which may result in serious injury or death.

**DO NOT** attempt to fit a tire unless you have the proper equipment and experience to perform the job. Have the work carried out by your Massey Ferguson Dealer or a qualified repair service.

When sealing tire beads onto rims, never exceed 2,4 bar (35 psi) or the maximum inflation pressure specified by the tire manufacture for fitting tires. Inflation beyond this maximum pressure may break the bead, or even the rim, with a dangerous explosive force. If both beads are not seated when the maximum pressure is reached, deflate, reposition the tire, re-lubricate the bead, and re-inflate.

Observe the following safety points:

- \* Always use a safety cage if available (Fig. 132).
- \* **DO NOT** re-inflate a tire that has been run flat or badly under-inflated without first removing it from the wheel and checking for damage. Any damage should be professionally repaired.
- \* **DO NOT** stand over or in front of the tire.
- \* Use a clip-on chuck and extension hose when inflating a tire and stand to one side.
- \* **DO NOT** hit a rim or tire with a hammer when the assembly is inflated.
- \* **NEVER** use a tube in a tire larger - or smaller - than the one for which it was designed.
- \* **NEVER** install tubes that have buckled or creased.
- \* **NEVER** rework, weld, heat or braze damaged rims.



Fig.132

# Maintenance and Adjustment

## Water ballasting



**WARNING:** When mixing the ballast solution it is imperative the calcium chloride flakes are added to the water and the solution stirred until the calcium chloride is dissolved. Never add water to calcium chloride. If the flakes should contact the eyes, wash the eyes immediately with clean, COLD water for at least five minutes. See a doctor as soon as possible.

Filling the front and rear tires with liquid ballast (Fig. 133) is a convenient method of adding weight to secure more traction and reduce slippage and tread wear. Either cast wheel weights can be added or the tires can be filled with a water/antifreeze solution of 50% to 75% of the tire volume, this will ensure similar flexibility to air inflated tires. Where freezing temperatures never occur, plain water can be used, but the weight added will be less. Where antifreeze protection is needed and in view of the trend towards greater environmental awareness, the use of calcium chloride is being phased out and alternative antifreeze additives used. Charts (see Specification section) are provided in the specification section giving the weights and capacity for water and calcium chloride. All recommendations for tube tires are directly applicable to tubeless. In the case of tubeless tires it is recommended that an antifreeze solution is used in place of calcium chloride to prevent corrosion of the rim. The antifreeze solution should be a mono ethylene glycol based fluid (radiator antifreeze). Frost protection (Table 10) using Massey Ferguson antifreeze as follows:

| Temperature °C (°F) | Antifreeze content<br>% by volume |
|---------------------|-----------------------------------|
| -5 (23)             | 12                                |
| -10 (14)            | 22                                |
| -15 (5)             | 29                                |
| -20 (-4)            | 35                                |
| -25 (-13)           | 40                                |
| -30 (-32)           | 44                                |
| -35 (-31)           | 48                                |
| -40 (-40)           | 52                                |

Table 10

### Mixing the solution of calcium chloride

Prepare the calcium chloride mixture in a suitable container by pouring the calcium chloride into the water (never the water into the calcium chloride, as considerable heat is generated in this mixing process). The mixture should be allowed to cool to atmospheric temperature before pumping into the tire. The pump can also be used to mix and cool this solution by circulating it through the pump and back into the barrel.

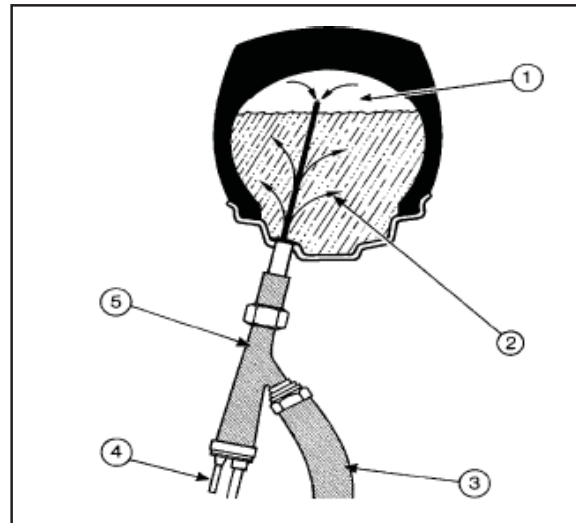


Fig.133

### Key to figure:

- 1) Air.
- 2) Water coming in.
- 3) Water supply hose.
- 4) Vent tube.
- 5) Filling adapter

### Filling

1. Jack up the tractor.
2. Turn the wheel to bring the valve to the top position.
3. Remove the valve core housing and make the connection with the pump using a special filling adaptor.
4. Pump into the tire the correct quantity of solution as detailed .
5. Set the final working pressure with the tire mounted on the tractor, with the weight on the tire, and the valve at the bottom using an air/water gauge.

### Removing

1. Jack up the tractor.
2. Turn the wheel to bring the valve to the bottom position.
3. Remove the valve core housing and make the connection with the pump using a special filling adaptor.
4. Completely evacuate the tire.
5. Re-inflate the tire to the recommended pressure.
6. The valve should be at the lowest point when checking or adjusting air pressure if the tire is liquid ballasted.



# Maintenance and Adjustment

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## Solution disposal

Antifreeze solution once drained from the tires should be disposed of in a manner fitting to that of a hazardous waste.

## Tire pressures

Because of the smaller air volume in ballasted tires, the pressures must be checked and adjusted much more frequently than when water is not present. It is recommended that checking the pressures is carried out every six weeks when the tractor is used in the field, and every three weeks for use on the roads (liquid ballasting is not recommended in the latter case).

## Wheel nut tightness

*Check the wheel nut tightness every 250 hours.*

If any of the wheels have been removed, or you are checking the tightness, the wheel nut tightening torques are as follows:

Front - two-wheel drive:

Wheel screws .....108 Nm (80 lbf ft)

Wheel nuts..... 95 Nm (70 lbf ft)

Rear - pressed wheel:

Disc to Axle Hub ..... 325 Nm (240 lbf ft)

Rim to Disc ..... 240 Nm (177 lbf ft)



**CAUTION:** *Recheck the torques after 10 hours (or 2 hours if on loader work) and then recheck and if necessary, re-tighten twice more at ten-hourly intervals. This protects against the loosening that occurs from the wheel settling down.*

## Maintenance and Adjustment

### Electrical equipment

To avoid damage to the components of the alternator charging system, the following service precautions must be observed:

- \***NEVER** make or break any of the charging circuit connections, including the battery when the engine is running.
- \***NEVER** short any of the charging components ground.
- \***ALWAYS** disconnect the battery ground cable before carrying out arc welding on the tractor.
- \***ALWAYS** disconnect the battery ground cable when charging the battery in the tractor.
- \***DO NOT** use a slave battery of higher than 12 volt nominal voltage.
- \***ALWAYS** observe correct polarity when installing the battery or using a slave battery to start the engine.
- \***ALWAYS** connect the ground cable first.  
Positive terminal and cable marked + (red).  
Ground terminal and cable marked - (black).

The electrical circuit is a 12 volt NEGATIVE GROUND system and requires little attention. Check and ensure that all cables are secured in place and that terminals are tight.

#### Battery

Check the battery every 250 hours.



**WARNING: The battery contains a sulfuric acid electrolyte which is a corrosive substance and must be treated with great care:**

- \*Corrosive substance.
- \*Keep out of the reach of children.
- \*Avoid contact with skin and eyes. Battery acid can cause intense irritation.
- \*Wear suitable protective clothing, gloves and eye protection.
- \*In case of contact with eyes rinse immediately with plenty of water and seek medical attention.
- \*When charging the battery, charge in a well ventilated place and **ALWAYS** switch off at the mains before disconnecting the terminals.
- \*If swallowed, seek medical advice immediately and show the label.
- \***DO NOT** use a naked flame to check the electrolyte level, always use a voltmeter or hydrometer to check the state of charge and a flashlight to check the battery electrolyte level if necessary.
- \*Ensure vent plugs are correctly and tightly installed.
- \*Always remove the ground (-) black, cable first.



Fig.134

To gain access to the battery in front of the radiator, just remove the grille (Fig. 134). Check the condition of the battery ensuring that the electrolyte is up to level. Clean the top of the battery, check that the terminals are tight and smear them with petroleum jelly.

Under normal use, maintenance-free batteries will not require topping up. In the event of an alternator failure always check the electrolyte levels. The height above the plates should be 15 mm (0.625 in). If low, adjust to the correct level by the addition of distilled or deionized water.

In the event of an accidental discharge it is strongly recommended that the battery is fully recharged in the workshop. The recharge should be carried out by a charger at 7 amps.

# Maintenance and Adjustment

## Alternator and fan belt

Check the fan and alternator belt tension every 250 hours.



**WARNING:** If the lower side panel (safety guard) is removed or loosened while checking the belt tension, it must be refitted and secured before restarting the tractor.

Fig. 135 gives a typical illustration of the alternator/fan belt arrangement; your tractor may differ slightly in the positioning of the adjustment link. Renew the belt if it is worn or damaged. To check the deflection, press down the belt with the thumb at the center of the longest free length. With moderate thumb pressure the correct deflection of the belt is 10 mm (0.375 in). If a belt tension gauge is available, the correct tension is 355 N (80 lbf), **DO NOT** allow the tension to fall below 220 N (50 lbf).

To adjust the belt tension:

1. Loosen the alternator pivot bolts (1) and the adjustment link bolt (2).
2. Change the position of the alternator to give the correct tension. Tighten the two bolts.
3. Recheck the belt tension to ensure that it is still correct.

**NOTE:** If a new belt is fitted, check/adjust the tension again after 25 hours of operation.

## Headlights

### Headlight adjustment

To adjust the headlights, screw the four screws (Fig. 136) in or out as required, this will deflect the beam up, down or sideways. On some models it is possible to adjust the headlights using a short screwdriver without opening the front grille.

To adjust the beam:

1. Position the tractor facing a wall or screen 7,5 m (25 ft) away, distance (A) (Fig. 137).
2. Draw a horizontal line on the wall or screen (1) the same as the center height of the headlights from the ground (B).
3. Draw two vertical lines (2), the same as the horizontal center to center distance between the headlights (C), (315 mm).
4. Draw a second horizontal line (3) at a distance (D) below and parallel to line (1). Distance (D) is calculated by multiplying distance (B) by 0.1; for example, headlight height 985 mm  $\times$  0.1 = 98,5 mm.
5. Adjust each headlight, on main beam, individually by covering the opposite one and aligning the upper edge of the illuminated zone to line (3).

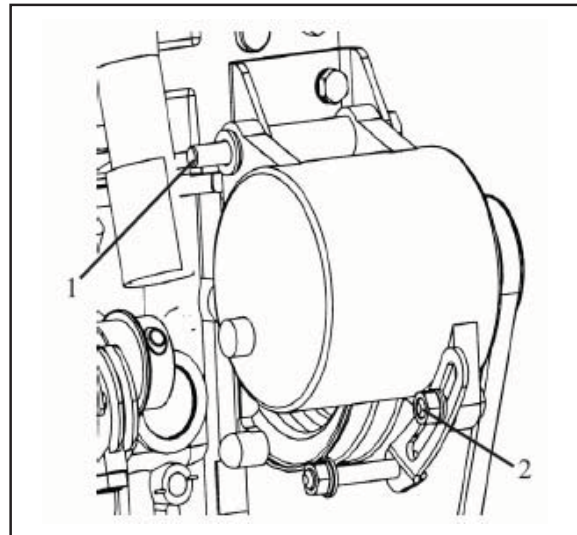


Fig.135



Fig.136

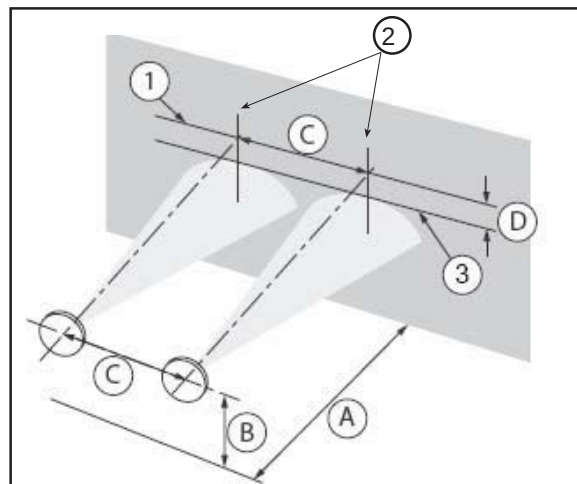


Fig.137

# Maintenance and Adjustment

## Bulb replacement

### Headlights

1. Switch off all light switches.
2. Remove the front grille (1, Fig. 138).
3. Remove the headlight wiring plug .
4. Remove the rubber surround (2).
5. Release the spring clip and remove the failed bulb (3).
6. Fit a new 40/45 watt bulb, reassemble the light unit and test.

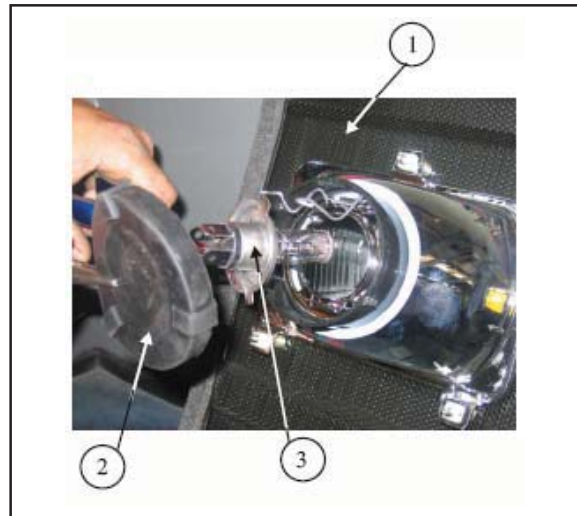


Fig.138

### Instrument panel illumination light bulbs

To renew any of the illumination lighting bulbs proceed as follows:

1. Switch off the main lights.
2. Remove and turn the instrument over, there are four bulbs:
  - a. Tractormeter illumination
  - b. Temperature and fuel gauge illumination
  - c. Digital display illumination
  - d. Indicator lamps illumination

3. Using a small plier first turn the bulb holder left and then pull the failed bulb out (Fig. 139) .
4. Fit new bulbs (see the watts of the bulbs below) in its holder, then push the bulb holder into the instrument panel and turn it to the right.

Watts:

- a. Instruments illumination - 12V - 1.2 W
- b. Temperature and fuel gauge illumination-12V- 2 W
- c. Digital display illumination - 12V - 0.8 W
- d. Indicator lamps illumination - 12V - 1.2 W

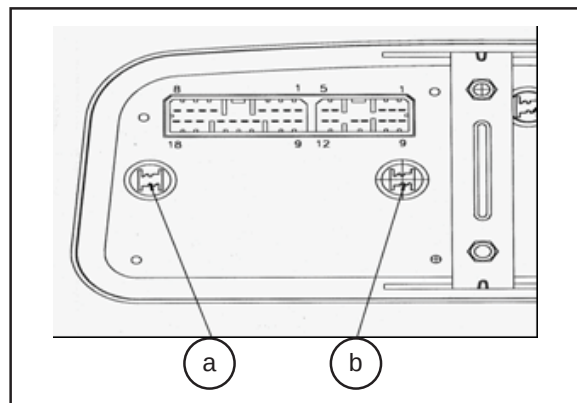


Fig.139

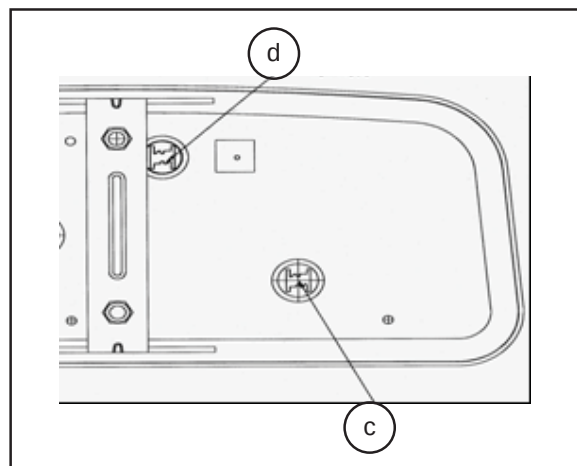


Fig.140

## Maintenance and Adjustment

### Rear work light bulb

1. Switch off the light.
2. Remove the four screws (1, Fig. 141) and the rim (2).
3. Ease the light unit out of the body by inserting a finger through the hole at the base of the body and moving the unit forward until it can be lifted out.
4. Remove the spring clip (3) from the back of the bulb holder, then remove the bulb (4).
5. Fit a new H3 55 watt halogen bulb and reassemble the light.

**NOTE:** The rear work light has a halogen bulb. Never touch a halogen bulb lens with the fingers. Natural moisture in the skin will cause the bulb to burn out when the light is switched on. Always use a clean cloth or tissue when handling halogen bulbs.

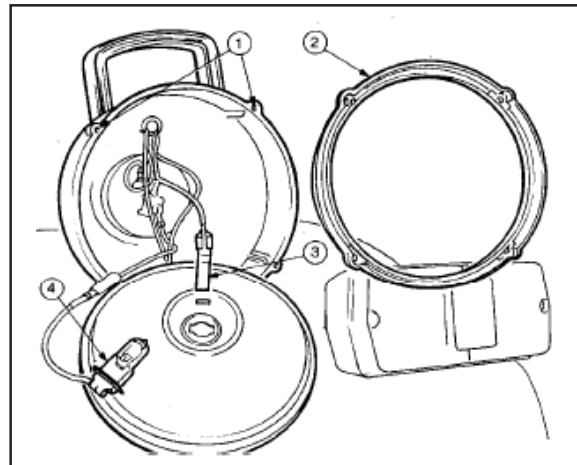


Fig.141

### Amber warning light bulb

1. Switch off the light
2. Loosen the screws (1, Fig. 142) and remove the lens (2).
3. Remove the failed bulb (3) from its fitting.
4. Fit a new 21 watt bulb, refit the lens and tighten the screws.

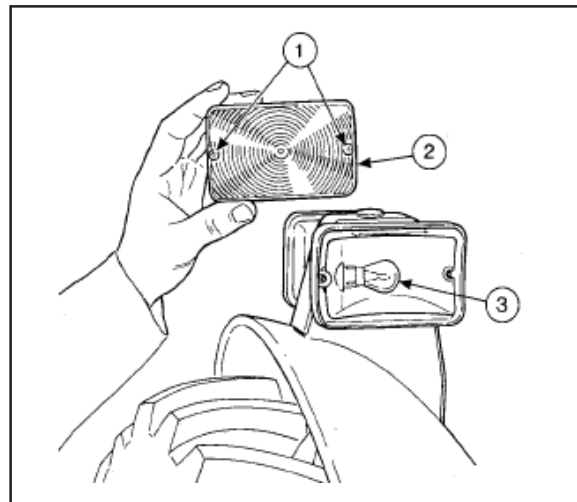


Fig.142

### Rear red light bulb

1. Switch off the light
2. Loosen the screws (1, Fig. 143) and remove the lens (2).
3. Remove the failed bulb (3) from its fitting.
4. Fit a new 5 watt bulb, refit the lens and tighten the screws.

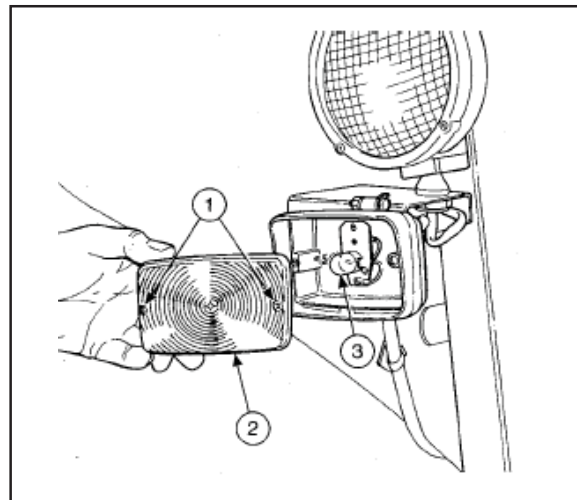


Fig.143



# Maintenance and Adjustment

## Flasher unit

### Replacement

The flasher unit for the flashing warning lights is located behind the instrument panel.

To replace the flasher unit:

1. Disconnect the battery, removing the negative cable (-) first in the interest of safety.
2. Remove the instrument panel cowl.
3. On the right hand side of the instrument panel remove the nut and bolt (Fig. 144) securing the flasher unit to the instrument panel.
4. Remove the unit from the tractor and pull out the plug from the base.
5. Reassemble with a new flasher unit ensuring that the plug is pushed firmly home. Reconnect the electrical supply and test the operation of the lights.

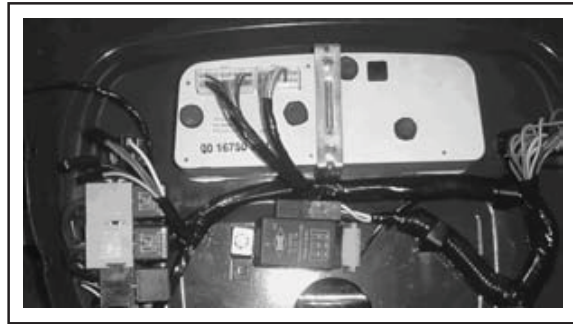


Fig.144

## Fuses

### Replacement

The single fuse box (Fig. 145) is situated at the left hand side of the fuel tank. To gain access proceed as follows:

1. Remove the left top-side panel.
2. Remove the fuse box cover.
3. Select the faulty fuse and replace with a new one.
4. The fuses in the box protect ten different circuits as detailed in Table 11.

**IMPORTANT: DO NOT** replace the blown fuse with another of a different rating. Always ensure that the new fuse is of the correct capacity as detailed in the table. For wiring diagram see page 112.



**WARNING: The tractor is NOT fitted with auxiliary electrical supply connectors or power sockets. DO NOT access the electrical supply by the use of clip connectors and cutting into the harness. This could result in an electrical short circuit and cause extensive fire damage.**

Contact your Massey Ferguson Dealer who will advise you of approved Massey Ferguson accessories and install them correctly on your tractor, together with the correct fuse rating. Use of NON-APPROVED accessories and fuse ratings may cause damage to the tractor or accessory.



Fig.145

| LINE FUSE  |       |
|------------|-------|
| CIRCUIT    | AMP.  |
| PREHEATING | 125 A |

Table 12

| Symbol No | DESCRIPTION                                  |
|-----------|----------------------------------------------|
| 1         | INSTRUMENTS AND WARNING LIGHTS (5A)          |
| 2         | BRAKE LIGHTS (15A)                           |
| 3         | INDICATOR LIGHTS + TRAILER IND. LIGHTS (10A) |
| 4         | ESOS + ADVANCE UNIT (7,5A)                   |
| 5         | WORK LAMP (PLOUGH LIGHT) (10A)               |
| 6         | STARTER RELAY (5A)                           |
| 7         | FUEL LIFT PUMP (7,5 A)                       |
| 8         | SIDE LIGHTS LH + TRAILER SIDE LIGHTS (5A)    |
| 9         | SIDE LIGHTS RH + TRAILER SIDE LIGHTS (5A)    |
| 10        | HAZARD WARNING + TRAILER HAZ. LIGHTS (20A)   |
| 11        | BEACON LAMP (10A)                            |
| 12        | DIPPED BEAM LIGHTS (20A)                     |
| 13        | MAIN HEADLIGHTS LH/RH (20A)                  |
| 14        | HORN (15A)                                   |

Table 11

## Maintenance and Adjustment

### Trailer socket (ISO)

A standard seven-pin trailer socket (Fig. 146) is also provided and mounted at the rear of the tractor, the connections are as follows:

1. Left-hand direction indicator.
2. Not used.
3. Ground
4. Right-hand direction indicator.
5. RH side light.
6. Stop.
7. LH side light.

### Safety signs

*Check safety signs every 250 hours.*

Replace any Danger, Warning, Caution or Instruction signs that are not readable or are missing. Replacement signs are available from your local Massey Ferguson Dealer in the event of loss or damage.

### Cleaning the tractor

Careful attention to the following will help to retain the value of your tractor and make the task of maintenance and adjustment quick and simple.

\*Use plenty of water to soften dirt adhering to the surface. If you use a jet of water, try and keep it away from electrical components such as the alternator and starter motor.

\*If it is found necessary to use detergents or high pressure hot water or steam cleaners, use care not to damage the paint work. Set the machine to the lower pressures and lower rates of detergent application.

\*Car polishes can be used on the metal work to improve the appearance of the tractor.

\*Aerosol cans of touch-up paint are available from your Massey Ferguson Dealer to repair chipped or damaged paint.

\*Check that all the safety signs are in place. The actual location and part numbers of these safety signs are illustrated in the safety section of this Operator Instruction Book, (see page 20 & 21). Replace any that have been lost or removed during cleaning.

### Tractor storage

If a tractor is to be stored for some considerable time, certain precautions should be taken to protect the tractor:

*Clean the tractor.*

1. Lubricate all the grease fittings.
2. Drain the engine, transmission and front axle (if fitted) and refill with fresh oil.
3. Clean the fuel system renewing the filter elements. Drain the fuel tank and pour approximately two gallons of special fuel injection pump calibrating fuel into the tank.
4. Run the engine for about 10 minutes to ensure complete distribution of the calibrating fluid throughout the system.
5. Raise the lift linkage hydraulically and support the lift arms in the fully raised position.
6. Remove the battery and store in a warm, dry atmosphere. Recharge periodically.
7. Place supports under the axles to take the weight off the tires.

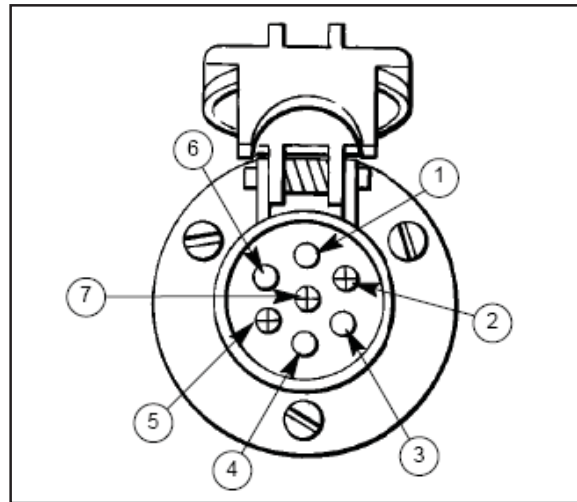


Fig.146

8. Drain the radiator and cylinder block and refill with a 50 per cent solution of Massey Ferguson antifreeze and clean water or use a suitable corrosion inhibitor.
9. Cover the exhaust pipe opening.
10. Cover exposed hydraulic cylinder rods with a thin coat of grease.

### Preparing the tractor for use after storage:

1. Inflate the tires to the correct pressure.
2. Remove the supports under the axles and lift linkage.
3. Refill the fuel tank.
4. Check the radiator coolant level.
5. Check all oil levels.
6. Fit a fully charged battery.
7. Remove the exhaust pipe covering.
8. Start the engine and check all controls are functioning correctly.
9. Drive the tractor without a load to ensure that it is operating satisfactorily.

# Maintenance and Adjustment

## Fuel handling and storage

### Diesel fuel

Before handling fuel, filling tanks etc., observe the following:

Under no circumstance should gasoline, alcohol, gasohol or dieselhol (a mixture of diesel fuel and alcohol) be added to diesel fuel because of increased fire or explosion risks. In a closed container such as a fuel tank they are more explosive than pure gasoline. **DO NOT** use these blends. Additionally, dieselhol is not approved due to possible inadequate lubrication of the fuel injection system.

\*Clean the filler cap area. Fill the tank at the end of each day to reduce overnight condensation.

\*Never take the cap off or refuel with the engine running or hot.

\*When filling the tank, keep control of the nozzle.

\***DO NOT** smoke.

\*Don't fill the tank to capacity. Allow room for expansion and wipe up spilled fuel immediately.

\*If the original cap is lost, replace it with a Massey Ferguson cap and tighten securely. A non Massey Ferguson cap may not be suitable.

\*Keep equipment properly maintained.

### Cleanliness and storage

The utmost care must be taken to keep fuel clean. The following advice is offered to promote satisfactory fuel handling and storage.

1. Never use galvanized containers.
2. Never clean the inside of containers, or components of the fuel system with a fluffy cloth.
3. The size of the bulk storage tank should be such that intervals between refilling and drainage are not too long. 3000 liter (700 US gal) capacity is sufficient for the average size farm.
4. The storage tank (Fig. 147) should be under cover and supported on cradles of sufficient height to enable the tractor fuel tank to be filled by gravity, and should have a suitable manhole cover to provide access for cleaning. The final outlet cock should be located to allow 76 mm (3 in) settling depth for water sludge; it should feed through a detachable filter with 120 mesh screen. There should be a fall of about 40 mm per meter ( $\frac{1}{4}$  in per ft) towards the sludge drain plug.
5. Drums (Fig. 148) should be stored under a protective cover to prevent the entry of water. Drums of fuel should not be stacked for a long period before use.
6. Drums in use outside must have the bung securely screwed down to prevent entry of water.
7. Bulk or drum storage tanks should be allowed 24 hours to settle before use, after delivery or servicing.

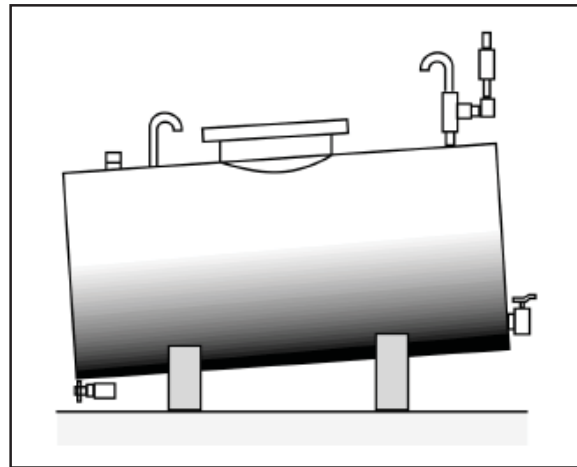


Fig.147

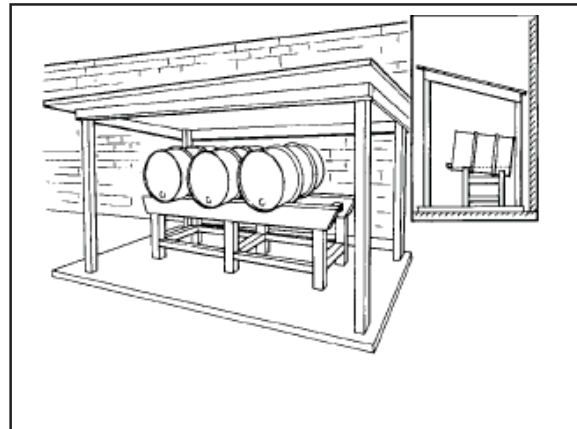


Fig.148

# Maintenance and Adjustment

## Fuel specifications

Limiting requirements for diesel fuel oils

See chart for fuel requirements:

| Grades of diesel fuel oil                                                                                 | Flash point (°F) °C | Pour point (°F) °C | Water and sediment volume % | Carbon residue on 10% residuum % | Ash weight % | Distillation temperatures °F (°C) |             | Viscosity at 100°F (37.8°C) |            | Copper strip corrosion | Sulfur weight % | Cetane numbers |
|-----------------------------------------------------------------------------------------------------------|---------------------|--------------------|-----------------------------|----------------------------------|--------------|-----------------------------------|-------------|-----------------------------|------------|------------------------|-----------------|----------------|
|                                                                                                           |                     |                    |                             |                                  |              | 90%                               |             | Kinematic, cSt (or SUS)     |            |                        |                 |                |
| No 1 - D A volatile distillate fuel oil for engines in service requiring frequent speed and load changes. | 37.8 (100) or legal | b                  | 0.05                        | 0.15                             | 0.01         | --                                | 287.8 (550) | 1.4 (550)                   | 2.5 (34.4) | 0.5 or legal           | No 3            | 40f            |
| No 2 - D A distillate fuel oil of lower volatility for engines in industrial and heavy mobile service.    | 51.7 (125) or legal | b                  | 0.05                        | 0.35                             | 0.01         | 282.2 (540c)                      | 338 (640)   | 2.0 (32.6)                  | 4.3 (40.1) | 0.50d or legal         | No 3            | 40f            |

Table 13

- To meet special operating conditions, modifications of individual limiting requirements may be agreed upon between purchaser, seller and manufacturer.
- For cold weather operation, the pour point should be specified 10°F (5.6°C) below the ambient temperature at which the engine is to be operated except where diesel fuel oil heating facilities are provided.
- When pour point less than 0°F (-17.8°C) is specified, the minimum viscosity shall be 1.8 cSt (32.0 SUS) and the minimum 90 percent shall be waived.
- In Countries outside the USA., other sulphur limits may apply.
- Where Cetane number by Method D 613 is not available, ASTM Method D 976 Calculated Cetane Index of Distillate Fuels 2 may be used as an approximation. Where there is disagreement, Method D 613 shall be the preferred method.
- Low atmospheric temperatures as well as engine operation at high altitudes may require use of fuels with higher cetane ratings.
- Low sulfur fuels may require an additional lubricity agent for fuel injection pump protection. Enquiries should be directed to your fuel supply source for assurance that adequate lubricity amounts are contained in the fuel purchased.

**NOTE:** Diesel fuels are classified as either No 1 (No 1-D) or No 2 (No 2-D) fuel. The grade No 1 fuel is recommended for service when the air temperature is below 32°F. The grade No 2 fuel, which will produce more work per gallon, is recommended for service when the air temperature is 32°F, or above.

## Fuel Cooling - ( MF 420/430 only)

To cool the injected fuel after injectors on return line, 420/430 model tractors are equipped with a fuel cooler (Fig. 149). By this cooler fuel temperature drops by 4 or 5°C. Afterwards, the cooled fuel returns the fuel tank.

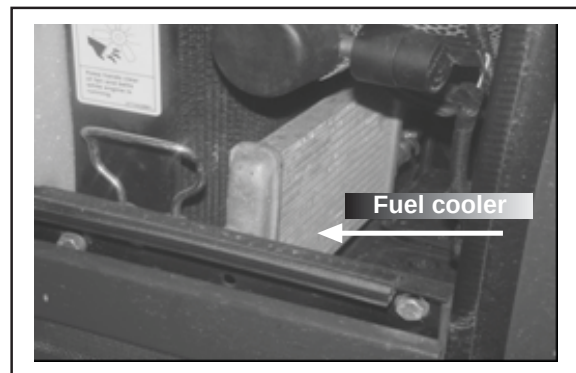


Fig.149

## Maintenance and Adjustment

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# Specifications

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# Specifications

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## Tractor specifications

### Engine:

|                                              |                                                                                                                                                        |
|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Make                                         | Perkins diesel to Massey Ferguson specification.                                                                                                       |
| Type                                         | Four stroke, water cooled, direct injection.                                                                                                           |
| <i>Tractor Models applicable:</i>            |                                                                                                                                                        |
| 410                                          | 1103C-33 - Naturally Aspirated - (low emission engine).                                                                                                |
| 420/430                                      | 1103C-33T - Turbocharged - (low emission engine).                                                                                                      |
| Cylinders                                    | 3                                                                                                                                                      |
| Stroke                                       | 127 mm (5 in).                                                                                                                                         |
| Bore                                         | 105 mm (4.134 in).                                                                                                                                     |
| Engine capacity                              | 3.3 liter (201 cu in).                                                                                                                                 |
| Firing order 1, 2, 3.                        |                                                                                                                                                        |
| Engine and PTO power and torque              | Consult the sales promotional leaflet for your model of tractor issued by your local Massey Ferguson Dealer at time of sale - Manufacturer's estimate. |
| Idle speed                                   | 750 rpm.                                                                                                                                               |
| Maximum rated speed                          | 2200 rpm.                                                                                                                                              |
| Maximum no load speed                        | 2470 rpm.                                                                                                                                              |
| Maximum torque at 1400 rpm (MF 410)          | 222 Nm                                                                                                                                                 |
| Maximum torque at 1400 rpm (MF 420)          | 270 Nm                                                                                                                                                 |
| Maximum torque at 1400 rpm (MF 430)          | 291 Nm                                                                                                                                                 |
| Lubrication                                  | Throw-away canister type full flow external filter.                                                                                                    |
| Valves                                       | Overhead, push rod operated.                                                                                                                           |
| <i>Valve tip clearance:</i>                  |                                                                                                                                                        |
| Inlet                                        | 0,20 mm (0.008 in) Cold.                                                                                                                               |
| Exhaust                                      | 0,45 mm (0.018 in) Cold.                                                                                                                               |
| Cooling System:                              |                                                                                                                                                        |
| Type                                         | Thermostat controlled with centrifugal pump to assist                                                                                                  |
| circulation.                                 |                                                                                                                                                        |
| Gear driven centrifugal water pump .         |                                                                                                                                                        |
| Radiator pressure cap rating                 | 1 bar (13.3 psi).                                                                                                                                      |
| Fan belt(s) deflection                       | 10 mm (3/8 in).                                                                                                                                        |
| Fuel System:                                 |                                                                                                                                                        |
| Fuel lift pump                               | Electrically driven.                                                                                                                                   |
| <i>Injection timing (static BTDC):</i>       |                                                                                                                                                        |
| 410/420/430                                  | Sealed and not adjustable.                                                                                                                             |
| Injectors                                    | Delphi nozzles and holders.                                                                                                                            |
| <i>Injector settings (working pressure):</i> |                                                                                                                                                        |
| 410/420/430                                  | 300 bar (4350 psi).                                                                                                                                    |
| Clamp & nut                                  | 30 Nm (23 lbf ft).                                                                                                                                     |
| High pressure pipe nuts                      | 22 Nm (16 lbf ft).                                                                                                                                     |
| Leak-off pipe nuts                           | 9,5 Nm (7 lbf ft).                                                                                                                                     |
| Starting aid                                 | Glow plugs                                                                                                                                             |
| Air System                                   |                                                                                                                                                        |
| Air cleaner                                  | Two-stage dry element with warning light. Removable main and safety element.                                                                           |
| Clutch                                       |                                                                                                                                                        |
| Type                                         | Dual or split torque (with cerametalic lining).                                                                                                        |
| Size - main clutch                           | 305 mm (12 in).                                                                                                                                        |
| PTO clutch (dual clutch)                     | 254 mm (10 in).                                                                                                                                        |
| Pedal clearance                              | 11 mm (7/16 in).                                                                                                                                       |
| PTO clutch clearance                         | 1,8 mm (0.070 in).                                                                                                                                     |

# Specifications

## Transmission

Gearbox types:

Eight-speed gearbox

The eight-speed gearbox, standard or synchromesh, has eight forward and two reverse speeds. This is achieved by using a four forward and one reverse speed gearbox, compounded by an epicyclic unit.

Eight-speed shuttle gearbox

The eight-speed synchromesh shuttle gearbox has eight forward and eight reverse speeds. The forward and reverse (shuttle) selection being controlled by a lever on the instrument panel adjacent to the steering wheel.

*Gearbox constant mesh gear ratio:*

All models

2.7368:1.

*Creep gearbox (if fitted )*

Reduction in all gears

4:1

Rear axle

410/420/430

Type

Planetary drive.

Normal duty.

Crown wheel and pinion ratio:

410/420/430

5.1428:1 - 7 x 37

*Maximum permissible load capacity:*

All models

3628 kg (7982 lb).

Rear track settings (all at 102 mm (4 in) increments):

*Pressed steel wheels:*

410/420/430

1220 mm (48 in) to 1930 mm (76 in).

Foot brakes -

410/420/430 planetary drive

Oil immersed mechanical operation, planetary drive

Parking brake

Operates on both rear wheels at the same time independent of the foot brakes.

Power take-off (PTO):

Live PTO / Independent PTO (IPTO)

Engaged by a lever on the left of the center housing.

PTO Speed - 410

540 rpm at 1685 engine rpm.

IPTO Speed - 420/430

540 rpm at 1789 engine rpm.

Shaft Diameter

35 mm (1 3/8 in).

No. of splines

6.

Engine to PTO shaft ratio:

MF 410

3.1176:1

MF 420/430

3.3125:1

Steering:

410/420/430

Hydrostatic power steering.

Pump

Tandem.

Toe-in - two-wheel drive axle

0 to 5 mm (0 to 3/16 in).

Toe-in - four-wheel drive axle

0 to 5 mm (0 to 3/16 in).

Steering wheel

Fixed.

*Turning circles:*

2WD

6500 mm .

4WD

7000 mm .

# Specifications

## Front axle

|                                                        |                                                                                |
|--------------------------------------------------------|--------------------------------------------------------------------------------|
| Type                                                   | Three section with telescopic outer arms and three-bolt fixing.                |
| Adjustment                                             |                                                                                |
| Two wheel drive -                                      | 102 mm (4 in) increments from 1220 mm (48 in) to a maximum of 1524 mm (60 in). |
| Four wheel drive -                                     | 102 mm (4 in) increments from 1372 mm (54 in) to a maximum of 1676 mm (66 in). |
| Wheel camber                                           | 3° 30'                                                                         |
| Wheel castor                                           | 4° 56'.                                                                        |
| Axle beam nut torque                                   | 205 Nm (150 lbf ft).                                                           |
| Track rod torques - Large lock-nut                     | 280 Nm (206 lbf ft).                                                           |
| Track rod torques - Location bolt                      | 85 Nm (63 lbf ft).                                                             |
| Track rod torques - Location bolt nut                  | 35 Nm (25 lbf ft).                                                             |
| Maximum vertical static load                           | 2025 kg (4464 lbf) at 1320 mm (52 in).                                         |
| <i>Two-wheel front axlewheel nut and bolt torques:</i> |                                                                                |
| Wheel nut torque                                       | 110 Nm (81 lbf ft).                                                            |
| Electrical system:                                     |                                                                                |
| Voltage                                                | 12 volt negative earth.                                                        |
| Battery:                                               | One 770 CCA (SAE)                                                              |
| Capacity                                               | 100 Ampere Hour (AH)                                                           |
| Starter motor - normal duty                            |                                                                                |
| Starter motor - rating                                 | 3 kW.                                                                          |
| Alternator                                             | 50 amp hour.                                                                   |

## Light bulbs - all 12 Volt

| Application                  | Watts   | Type                  | Cap   | MF part number |
|------------------------------|---------|-----------------------|-------|----------------|
| Headlight (White)            | 60/55 W | H4 Halogen            | P45t  |                |
| Work light                   | 55 W    | H3 Halogen            | PK22s | 1628 494 M1    |
| Warning light-turn indicator | 21 W    | Single center contact | BA15s | 621 235 M1     |
|                              |         | Single center contact | BA15s | 1420 037 M1    |

## Hydraulic System:

|                               |                                                                                                                                                                           |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Linkage pump                  | Four-cylinder scotch yoke pump, driven from the forward end of the PTO shaft supplying oil under pressure to the linkage ram cylinder, and four external take off points. |
| Maximum pump output           | All tractors 16,7 liter/min (4.4 US gal/min).                                                                                                                             |
| <i>Maximum pump pressure:</i> |                                                                                                                                                                           |
| All models                    | 176 bar (2550 psi).                                                                                                                                                       |
| Filtration                    | 140 micron washable strainer.                                                                                                                                             |
| Lift cylinder size            | 79,4 mm (3 1/8 in).                                                                                                                                                       |

## Maximum lift capacity at the lower links with links horizontal:

|                   |                                             |
|-------------------|---------------------------------------------|
| Models 410        | 1450 kg (3196 lbf)                          |
| 420/430           | 1790 kg (3946 lbf)                          |
| Hydraulic linkage | Category 1 and 2 interchangeable ball ends. |

## Specifications

---

### Drawbar

*Standard:*

*Maximum static load:*

|                         |                      |
|-------------------------|----------------------|
| Inner position          | 1000 kgf (2205 lbf). |
| Center position         | 775 kgf (1710 lbf).  |
| Fully extended position | 775 kgf (1710 lbf).  |

*Distance to PTO shaft:*

|                                               |                   |
|-----------------------------------------------|-------------------|
| Inner position                                | 250 mm (10 in).   |
| center position                               | 350 mm (14 in).   |
| Fully extended position                       | 400 mm (16 in).   |
| Drawbar face to center of PTO shaft - Minimum | 65 mm (2.5 in).   |
| Drawbar face to center of PTO shaft - Maximum | 265 mm (10.1 in). |
| Drawbar side swing from center                | 240 mm (9.5 in).  |

*Capacities:*

*Engine sump oil - including filter:*

|            |                          |
|------------|--------------------------|
| All models | 6,8 liter (1.80 US gal). |
|------------|--------------------------|

*Transmission/hydraulic oil:*

|                                        |                            |
|----------------------------------------|----------------------------|
| All models                             | 35 liter (9.2 US gal).     |
| Additional oil if creep gearbox fitted | 2 liter (0.53 US gal).     |
| Fuel tank                              | 48 liter (12.7 US gal).    |
| Cooling system                         | 10,70 liter (2.83 US gal). |



# Specifications

## Tractor dimensions and weights

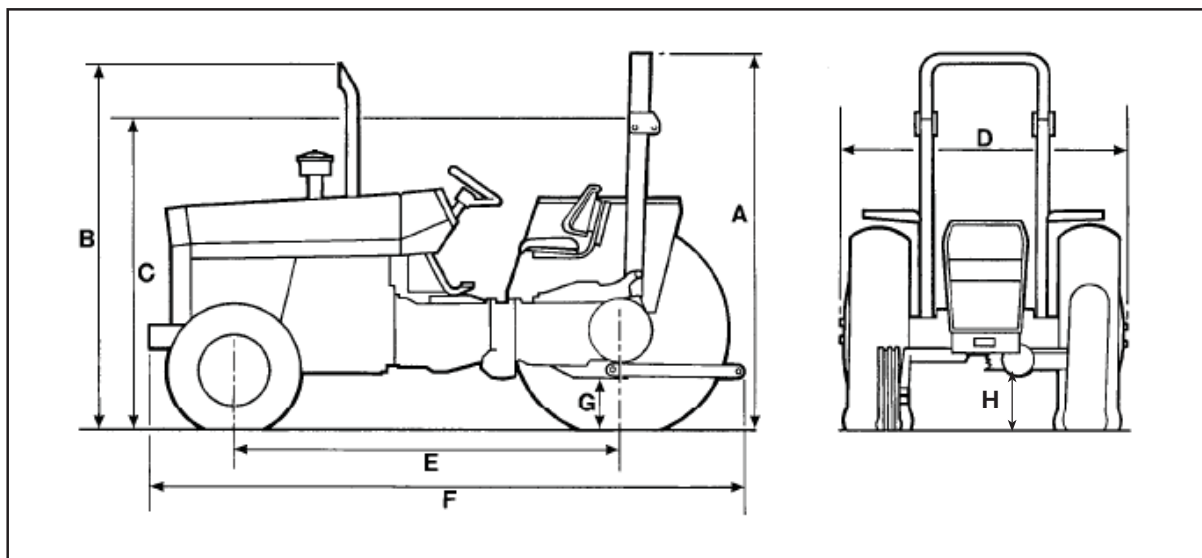


Fig. 150

| Tractor models |                                     | MF 410<br>(13.6-28/6.00-16<br>Tires) | MF 420<br>(14.9-24/9.5L-15<br>Tires) | MF 430<br>(14.9-24/9.5L-15<br>Tires) |
|----------------|-------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| A              | Height over (ROPS)                  | 2366 mm (93.15 in)                   | 2342 mm (92.2 in)                    | 2342 mm (92.2 in)                    |
| B              | Height over exhaust                 | 2100 mm (82.5 in)                    | 2100 mm (82.5 in)                    | 2100 mm (82.5 in)                    |
| C              | Height over folded down ROPS        | 1785 mm (70.3 in)                    | 1722 mm (67.8 in)                    | 1722 mm (67.8 in)                    |
| D              | Minimum width                       | 1665 mm (65.5 in)                    | 1700 mm (66.9 in)                    | 1700 mm (66.9 in)                    |
| E              | Wheelbase - without creep*          | 1940 mm (76.4 in)                    | 1940 mm (76.4 in)                    | 1940 mm (76.4 in)                    |
| F              | Overall length - without creep*     | 3255 mm (128.1 in)                   | 3220 mm (126.8 in)                   | 3220 mm (126.8 in)                   |
| G              | Ground clearance under drawbar sup. | 340 mm (13.4 in)                     | 267 mm (10.5 in)                     | 267 mm (10.5 in)                     |
| H              | Ground clearance under front axle   | 315 mm (12.4 in)                     | 203 mm (8.0 in)                      | 203 mm (8.0 in)                      |
|                | Weight - with fuel, oil and water   | 1960 kg (4321 lb)                    | 2435 kg (5369 lb)                    | 2435 kg (5369 lb)                    |
|                | Weight - Front axle                 | 790 kg (1742 lb)                     | 940 kg (2073 lb)                     | 940 kg (2073 lb)                     |
|                | Weight - Rear axle                  | 1170 kg (2579 lb)                    | 1495 kg (3296 lb)                    | 1495 kg (3296 lb)                    |

Table 14

# Specifications

## Tractor dimensions and weights (CAB)

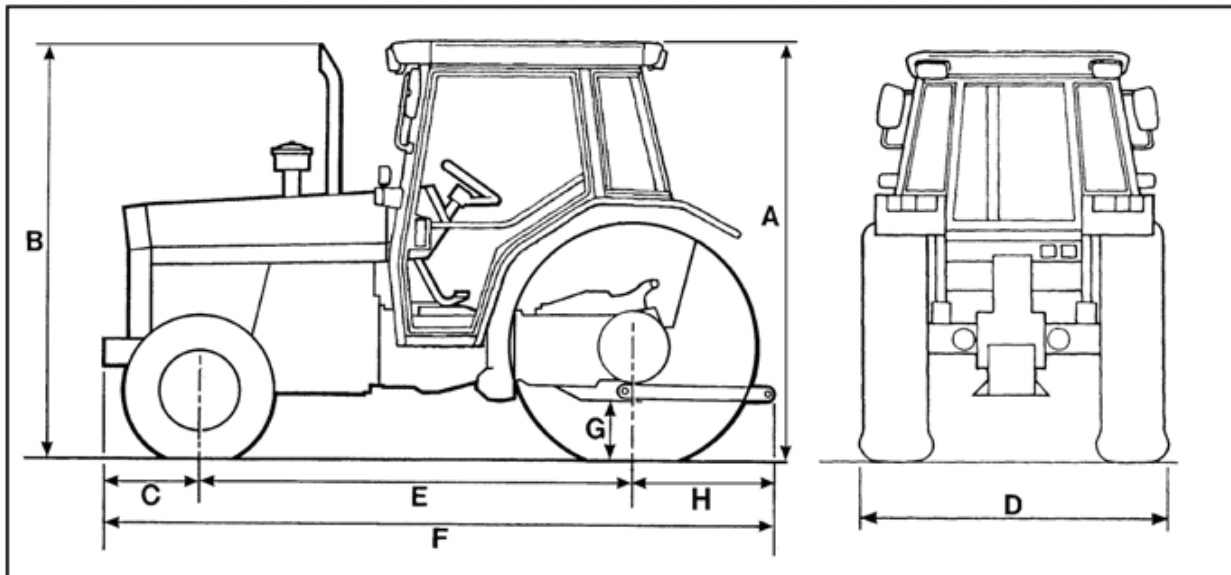


Fig. 151

|   | Tractor models                          | MF 420<br>(14.9-28/9.5L-15<br>Tires) | MF 430<br>(14.9-28/9.5L-15<br>Tires) |  |
|---|-----------------------------------------|--------------------------------------|--------------------------------------|--|
| A | Height over (CAB)                       | 2410 mm (94.9 in)                    | 2410 mm (94.9 in)                    |  |
| B | Height over exhaust                     | 2100 mm (82.5 in)                    | 2100 mm (82.5 in)                    |  |
| C | Width front wheel center - bumper       | 415 mm (16.3 in)                     | 415 mm (16.3 in)                     |  |
| D | Max. width                              | 2291 mm (90.2 in)                    | 1700 mm (90.2 in)                    |  |
| E | Wheelbase                               | 2120 mm (83.5 in)                    | 2120 mm (83.5 in)                    |  |
| F | Overall length                          | 3470 mm (136.6 in)                   | 3470 mm (136.6 in)                   |  |
| G | Ground clearance under drawbar sup.     | 267 mm (10.5 in)                     | 267 mm (10.5 in)                     |  |
| H | Width lower links end- rear axle center | 975 mm (38.4 in)                     | 975 mm (38.4 in)                     |  |
|   | Weight - with fuel, oil and water       | 2445 kg (5369 lb)                    | 2440 kg (5369 lb)                    |  |
|   | Weight - Front axle                     | 955 kg (2073 lb)                     | 920 kg (2073 lb)                     |  |
|   | Weight - Rear axle                      | 1490 kg (3296 lb)                    | 1520 kg (3296 lb)                    |  |

Table 14-1

# Specifications

## Road speed chart

The following two charts show the road speeds for tractors, in km/hr (mph) with various types of transmission or rear axle. All the speed charts are based on the engine running at rated speed. These charts are a guide only. Refer to the speed chart on your tractor which has been prepared for the tires and overall transmission ratio. If you require more precise speeds contact your Massey Ferguson Dealer.

| Eight speed Shuttle Gearbox - 8x8   |             |
|-------------------------------------|-------------|
| Gear kph (mph) 14.9 - 28 Rear Tires |             |
| Forward speeds - Low range          |             |
| 1                                   | 2.9 (1.8)   |
| 2                                   | 4.4 (2.7)   |
| 3                                   | 6.4 (4.0)   |
| 4                                   | 9.1 (5.6)   |
| Forward speeds - High range         |             |
| 1                                   | 11.8 (7.3)  |
| 2                                   | 17.7 (11.0) |
| 3                                   | 25.8 (16.0) |
| 4                                   | 36.6 (22.7) |
| Reverse speeds - Low range          |             |
| 1                                   | 3.0 (1.9)   |
| 2                                   | 4.5 (2.8)   |
| 3                                   | 6.5 (4.0)   |
| 4                                   | 9.3 (5.8)   |
| Reverse speeds - High range         |             |
| 1                                   | 12.1 (7.5)  |
| 2                                   | 18.2 (11.3) |
| 3                                   | 26.3 (16.3) |
| 4                                   | 37.4 (23.6) |

Table 15

| Eight-speed standard gearbox |                  |
|------------------------------|------------------|
| Forward speed - Low range    |                  |
| Gear                         | 13.6/11-28 tires |
| 1                            | 2,5 (1.6)        |
| 2                            | 3,7 (2.3)        |
| 3                            | 6,8 (4.2)        |
| 4                            | 8,3 (5.2)        |
| Forward speed - High range   |                  |
| 1                            | 10,1 (6.3)       |
| 2                            | 14,8 (9.2)       |
| 3                            | 27,0 (16.8)      |
| 4                            | 33,2 (20.6)      |
| Reverse speed - Low range    |                  |
|                              | 3,4 (2.1)        |
| Reverse speed - High range   |                  |
|                              | 13,7 (8.5)       |

Table 16

# Specifications

## Water ballasting

Water/calcium chloride solution - capacity and weight

\*Table 12 below is provided for convenience in estimating the additional weight gained (per tire) by the use of liquid weighting; liters (US gal), kg (lb).

\*All mixtures are based on a 75% fill in order to retain 25% air volume for cushioning purposes.

\*Water/calcium chloride solutions are indicated from no protection against freezing at all, down to a temperature of minus 35° C (minus 31° F).



**CAUTION:** Water/Calcium chloride solution as used in tractor tires is not dangerous, but because it may attack clothing or cause skin irritations on some persons, especially if it comes in contact with open cuts or sores, we urge all personnel to avoid coming in direct contact with it. A remedy after having contacted this solution, is to simply wash the skin with plenty of clean water.

|           | No freezing protection    | To minus 14°C (minus 7°F) |               |               | To minus 35°C (minus 31°F) |               |               |
|-----------|---------------------------|---------------------------|---------------|---------------|----------------------------|---------------|---------------|
| Tire size | Water only liter (US gal) | Water liter (US gal)      | Ca Cl kg (lb) | Total kg (lb) | Water liter (US gal)       | Ca Cl kg (lb) | Total kg (lb) |
| 7.50 - 16 | 35 (9)                    | 33 (9)                    | 6 (13)        | 39 (86)       | 29 (6)                     | 12 (26)       | 41 (90)       |
| 9.50 - 16 | 45 (12)                   | 42 (11)                   | 8 (18)        | 50 (110)      | 39 (9)                     | 16 (35)       | 55 (121)      |
| 12.4 - 16 | 80 (21)                   | 75 (20)                   | 13 (29)       | 88 (194)      | 68 (15)                    | 29 (64)       | 97 (213)      |
| 9.5 - 24  | 65 (17)                   | 61 (16)                   | 11 (24)       | 72 (158)      | 56 (12)                    | 23 (51)       | 79 (174)      |
| 11.2 - 24 | 90 (24)                   | 84 (22)                   | 15 (33)       | 99 (218)      | 77 (17)                    | 33 (73)       | 110 (242)     |
| 12.4 - 24 | 115 (30)                  | 108 (29)                  | 19 (42)       | 127 (279)     | 99 (22)                    | 41 (90)       | 140 (308)     |
| 13.6 - 24 | 145 (38)                  | 136 (36)                  | 24 (53)       | 160 (352)     | 125 (28)                   | 52 (114)      | 177 (389)     |
| 14.9 - 24 | 175 (46)                  | 163 (43)                  | 30 (66)       | 193 (425)     | 150 (33)                   | 63 (139)      | 213 (469)     |
| 16.9 - 24 | 230 (61)                  | 214 (57)                  | 39 (86)       | 253 (557)     | 197 (43)                   | 83 (183)      | 280 (616)     |
| 14.9 - 26 | 180 (48)                  | 168 (44)                  | 31 (68)       | 199 (438)     | 154 (34)                   | 65 (143)      | 219 (482)     |
| 16.9 - 26 | 245 (65)                  | 229 (60)                  | 41 (90)       | 270 (594)     | 210 (46)                   | 88 (194)      | 298 (656)     |
| 18.4 - 26 | 300 (79)                  | 280 (74)                  | 50 (110)      | 330 (726)     | 257 (57)                   | 108 (238)     | 365 (803)     |
| 11.2 - 28 | 100 (26)                  | 93 (25)                   | 17 (37)       | 110 (242)     | 86 (19)                    | 36 (79)       | 122 (268)     |
| 12.4 - 28 | 130 (34)                  | 121 (32)                  | 22 (48)       | 143 (315)     | 111 (24)                   | 47 (103)      | 158 (348)     |
| 13.6 - 28 | 165 (44)                  | 154 (41)                  | 28 (62)       | 192 (422)     | 142 (31)                   | 59 (130)      | 201 (422)     |
| 14.9 - 28 | 200 (53)                  | 186 (49)                  | 34 (75)       | 230 (506)     | 172 (38)                   | 72 (158)      | 244 (537)     |
| 16.9 - 28 | 260 (69)                  | 242 (64)                  | 44 (97)       | 286 (629)     | 223 (49)                   | 94 (207)      | 317 (697)     |
| 18.4 - 28 | 320 (85)                  | 298 (79)                  | 54 (119)      | 352 (774)     | 275 (61)                   | 115 (253)     | 390 (858)     |

Table 17

# Specifications

## Tire load and inflation tables

The correct inflation pressure (Table 18) is the most important factor contributing to satisfactory performance of agricultural tires. Correct inflation pressure can be determined by weighing the loaded axle (for example, the rear axle with the implement in the raised position) and then referring to the load and inflation tables for the relevant tires. Tire loads should be calculated to include full bins and tanks as well as weights and ballast. One should only increase recommended inflation pressures of agricultural tires for reduced speed/higher load applications, hillside plowing and operation on hard surfaces for any length of time - such as road transport. Tire load carrying capacities vary with speed - increased loads often apply at lower speeds, and reduced loads at higher speeds than those indicated in the following tables. The load capacity in the tables is given in kilograms (kg) at a speed not exceeding 30 km/hr (20 mph).

## Determining the weight

With the implement mounted on the 3-point hitch drive the tractor onto a weighbridge so that the rear wheels only are on the platform. Take the weight reading and divide by two, compare the weight and tire size with the table below to determine the tire pressure. For example:

Tractor on 13.6R28 tires weighing 2160 kg (4762 lb) divided by 2 = 1080 kg (2381 lb) per wheel. 1070 kg (2359 lb) is the nearest reading, tire pressure is 0,6 bar (9 psi).

### Rear radial drive tires.

Load capacity kg (lb) - inflation bar (psi) at 30km/hr (20 mph).

| TIRE SIZE | 0,5 bar<br>(7 psi) | 0,6 bar<br>(9 psi) | 0,8 bar<br>(12 psi) | 1,0 bar<br>(15 psi) | 1,2 bar<br>(17 psi) | 1,4 bar<br>(20 psi) | 1,6 bar<br>(23 psi) |
|-----------|--------------------|--------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| 12.4R 20  | 760 (1676)         | 885 (1951)         | 960 (2116)          | 1040 (2293)         | 1115 (2458)         | 1225 (2701)         | 1340 (2954)         |
| 9.5R 24   | 580 (1279)         | 675 (1488)         | 735 (1620)          | 800 (1764)          | 860 (1896)          | 955 (2105)          | 1045 (2304)         |
| 11.2R 24  | 715 (1576)         | 830 (1830)         | 905 (1995)          | 975 (2150)          | 1050 (2315)         | 1155 (2546)         | 1265 (2789)         |
| 12.4R 24  | 830 (1830)         | 965 (2127)         | 1045 (2304)         | 1130 (2491)         | 1210 (2668)         | 1335 (2943)         | 1455 (3208)         |
| 13.6R 24  | 875 (1929)         | 1015 (2238)        | 1105 (2436)         | 1195 (2635)         | 1285 (2833)         | 1415 (3120)         | 1550 (3417)         |
| 14.9R 24  | 1000 (2205)        | 1165 (2568)        | 1275 (2811)         | 1385 (3053)         | 1495 (3296)         | 1655 (3649)         | 1820 (4012)         |
| 14.9R 26  | 1030 (2271)        | 1200 (2646)        | 1315 (2899)         | 1425 (3142)         | 1540 (3395)         | 1705 (3759)         | 1875 (4134)         |
| 16.9R 26  | 1290 (2844)        | 1500 (3307)        | 1640 (3616)         | 1775 (3913)         | 1915 (4222)         | 2125 (4685)         | 2335 (5148)         |
| 18.4R 26  | 1520 (3351)        | 1765 (3891)        | 1915 (4222)         | 2070 (4564)         | 2220 (4894)         | 2450 (5401)         | 2675 (5897)         |
| 11.2R 28  | 760 (1676)         | 885 (1951)         | 960 (2116)          | 1040 (2293)         | 1115 (2458)         | 1225 (2701)         | 1340 (2954)         |
| 12.4R 28  | 875 (1929)         | 1015 (2238)        | 1105 (2436)         | 1195 (2635)         | 1285 (2833)         | 1415 (3120)         | 1550 (3417)         |
| 13.6R 28  | 920 (2028)         | 1070 (2359)        | 1170 (2579)         | 1265 (2789)         | 1365 (3009)         | 1515 (3340)         | 1660 (3660)         |
| 14.9R 28  | 1060 (2337)        | 1230 (2712)        | 1345 (2965)         | 1465 (3230)         | 1580 (3483)         | 1750 (3858)         | 1925 (4244)         |
| 16.9R 28  | 1335 (2943)        | 1550 (3417)        | 1690 (3726)         | 1835 (4045)         | 1975 (4354)         | 2185 (4817)         | 2395 (5280)         |

Table 18



# Specifications

## Rear cross-ply drive tires

Load capacity kg (lb) - inflation bar (psi) at 30km/hr (20 mph).

|         | 1,0 bar<br>(15 psi) | 1,1 bar<br>(16 psi) | 1,2 bar<br>(17 psi) | 1,3 bar<br>(19 psi) | 1,4 bar<br>(20 psi) | 1,5 bar<br>(22 psi) | 1,6 bar<br>(23 psi) | 1,7 bar<br>(25 psi) | 1,8 bar<br>(26 psi)    | 1,9 bar<br>(28 psi) | 2,0 bar<br>(29 psi)    | 2,1 bar<br>(30 psi) |
|---------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|------------------------|---------------------|------------------------|---------------------|
| 11.2-24 | 725<br>(1595)       | 765<br>(1683)       | 805<br>(1771)       | 845 (4)<br>(1859)   | 885<br>(1947)       | 920<br>(2024)       | 960<br>(2112)       | 1005<br>(2211)      | 1045 (6)<br>(2299)     | 1060<br>(2332)      | 1090<br>(2398)         | 1135<br>(2497)      |
| 12.4-24 | 890<br>(1958)       | 945<br>(2079)       | 995<br>(2189)       | 1035<br>(2277)      | 1075<br>(2365)      | 1115<br>(2453)      | 1160<br>(2552)      | 1200 (6)<br>(2640)  | 1235<br>(2717)         | 1260<br>(2772)      | 1320<br>(2904)         | 1345<br>(2959)      |
| 13.6-24 | 1030 (4)<br>(2266)  | 1080<br>(2376)      | 1135<br>(2497)      | 1200<br>(2640)      | 1250<br>(2750)      | 1300<br>(2860)      | 1340 (6)<br>(2948)  | 1390<br>(3058)      | 1445<br>(3179)         | 1500<br>(3300)      | 1545 (8)<br>(3399)     | –                   |
| 14.9-24 | 1250<br>(2750)      | 1315<br>(2893)      | 1380<br>(3036)      | 1440<br>(3168)      | 1510 (6)<br>(3322)  | 1565<br>(3443)      | 1635<br>(3597)      | 1700<br>(3740)      | 1760 (8)<br>(3872)     | 1805<br>(3971)      | 1850<br>(4070)         | 1900<br>(4180)      |
| 16.9-24 | 1480<br>(3256)      | 1565<br>(3443)      | 1645<br>(3619)      | 1725 (6)<br>(3795)  | 1805<br>(3971)      | 1885<br>(4147)      | 1960<br>(4312)      | 2040 (8)<br>(4488)  | 2105<br>(4631)         | 2170<br>(4774)      | 2240<br>(10)<br>(4928) | 2315<br>(5093)      |
| 14.9-26 | 1300<br>(2860)      | 1365<br>(3003)      | 1430<br>(3146)      | 1495<br>(3289)      | 1560 (6)<br>(3432)  | 1640<br>(3608)      | 1690<br>(3719)      | 1755<br>(3861)      | 1820 (8)<br>(4004)     | –                   | –                      | –                   |
| 16.9-26 | 1525<br>(3355)      | 1645<br>(3619)      | 1700<br>(3740)      | 1780 (6)<br>(3916)  | 1860<br>(4092)      | 2000<br>(4400)      | 2020<br>(4444)      | 2105 (8)<br>(4631)  | 2170<br>(4774)         | 2235<br>(4917)      | 2305<br>(10)<br>(5071) | –                   |
| 18.4-26 | 1880<br>(4136)      | 1990 (6)<br>(4378)  | 2080<br>(4576)      | 2175<br>(4785)      | 2265 (8)<br>(4983)  | 2360<br>(5192)      | 2455<br>(5401)      | 2660<br>(5852)      | 2645<br>(10)<br>(5819) | 2715<br>(5973)      | 2780<br>(6116)         | 2830<br>(5236)      |
| 11.2-28 | 770<br>(1694)       | 815<br>(1793)       | 860<br>(1892)       | 900 (4)<br>(1990)   | 945<br>(2079)       | 1000<br>(2200)      | 1040<br>(2288)      | 1070<br>(2354)      | 1115 (6)<br>(2453)     | 1145<br>(2519)      | 1180<br>(2596)         | 1210<br>(2662)      |
| 12.4-28 | 935<br>(2057)       | 1005 (4)<br>(2211)  | 1050<br>(2310)      | 1095<br>(2409)      | 1140<br>(2508)      | 1175<br>(2585)      | 1225<br>(2695)      | 1275 (6)<br>(2805)  | 1315<br>(2893)         | 1355<br>(2981)      | 1390<br>(3058)         | 1430<br>(3146)      |
| 13.6-28 | 1100<br>(2420)      | 1156<br>(2543)      | 1210<br>(2662)      | 1300<br>(2860)      | 1320<br>(2904)      | 1400<br>(3080)      | 1430 (6)<br>(3146)  | 1485<br>(3267)      | 1540<br>(3388)         | 1600<br>(3520)      | 1645 (8)<br>(3619)     | 1700<br>(3740)      |
| 14.9-28 | 1335<br>(2937)      | 1400<br>(3080)      | 1470<br>(3234)      | 1540<br>(3388)      | 1610 (6)<br>(3542)  | 1675<br>(3685)      | 1745<br>(3839)      | 1810<br>(3982)      | 1880 (8)<br>(4136)     | 1925<br>(4235)      | 1975<br>(4345)         | 2025<br>(4455)      |
| 16.9-28 | 1580<br>(3476)      | 1670<br>(3674)      | 1755<br>(3861)      | 1840 (6)<br>(4048)  | 1925<br>(4235)      | 2010<br>(4422)      | 2090<br>(4598)      | 2175 (8)<br>(4785)  | 2245<br>(4939)         | 2310<br>(5082)      | 2380<br>(10)<br>(5236) | 2460<br>(5412)      |

Table 19

**NOTE:** The single and double figures between parentheses ( ) indicate the ply rating of the tire. Load capacity and inflation pressures indicated are the maximum permissible for the stated ply rating.

# Specifications

## Front steering tires (non-driven)

Load capacity kg (lb) - inflation bar (psi) at 30km/hr (20 mph).

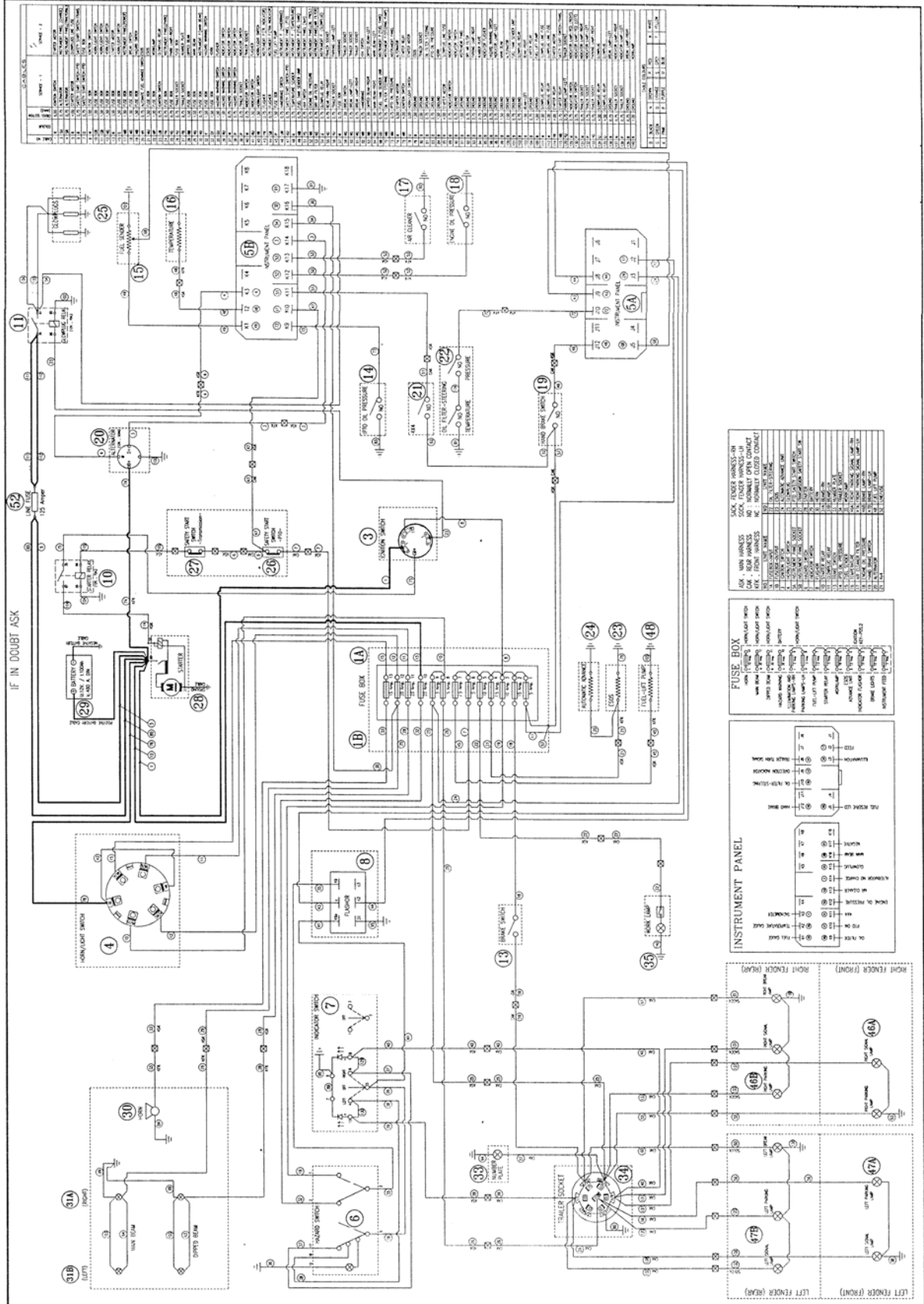
|         | 1,5 bar<br>(22 psi) | 1,7 bar<br>(25 psi) | 1,9 bar<br>(28 psi) | 2,0 bar<br>(29 psi) | 2,2 bar<br>(32 psi) | 2,3 bar<br>(33 psi) | 2,5 bar<br>(36 psi) | 2,7 bar<br>(39 psi) | 2,8 bar<br>(41 psi) | 3,0 bar<br>(44 psi)   | 3,1 bar<br>(45 psi) | 3,3 bar<br>(48 psi) | 3,4 bar<br>(49 psi) |
|---------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|-----------------------|---------------------|---------------------|---------------------|
| 9.00-10 | 500<br>(1100)       | 530<br>(1166)       | 560<br>(1232)       | 575<br>(1265)       | 610<br>(1342)       | 625<br>(1375)       | 660<br>(1452)       | 690<br>(1518)       | 710<br>(1562)       | 750<br>(1650)         | 765<br>(1683)       | 795<br>(1749)       | 810<br>(1782)       |
| 7.5L-15 | 490<br>(1056)       | 530<br>(1166)       | 565<br>(1243)       | 585 (4)<br>(1287)   | 620<br>(1364)       | 640<br>(1408)       | 670<br>(1474)       | 700<br>(1540)       | 720 (6)<br>(1584)   | 750<br>(1650)         | 765<br>(1683)       | 790<br>(1738)       | 805<br>(1771)       |
| 9.5L-15 | 600<br>(1320)       | 645<br>(1419)       | 690<br>(1518)       | 710<br>(1562)       | 750<br>(1650)       | 770 (6)<br>(1694)   | —                   | —                   | —                   | —                     | —                   | —                   | —                   |
| 11L-15  | 730<br>(1606)       | 730<br>(1606)       | 785<br>(1727)       | 840<br>(1848)       | 865 (6)<br>(1903)   | 915<br>(2013)       | 940<br>(2068)       | 995<br>(2189)       | 1045<br>(2299)      | 1070<br>(8)<br>(2354) | —                   | —                   | —                   |
| 6.00-16 | 340<br>(748)        | 370<br>(814)        | 400<br>(880)        | 415<br>(913)        | 440<br>(968)        | 450 (4)<br>(990)    | 475<br>(1045)       | 495<br>(1089)       | 505<br>(1111)       | 525<br>(1155)         | 540<br>(1188)       | 560 (6)<br>(1232)   | 570<br>(1254)       |
| 6.50-16 | 380<br>(836)        | 415<br>(913)        | 450<br>(990)        | 470<br>(1034)       | 500<br>(1100)       | 510 (4)<br>(1122)   | 540<br>(1188)       | 565<br>(1243)       | 580<br>(1276)       | 600<br>(1320)         | 615 (6)<br>(1353)   | —                   | —                   |

Table 20

**NOTE:** Single and double figures between parentheses ( ) indicate the ply rating of the tire. Load capacity and inflation pressures indicated are the maximum permissible for the stated ply rating.

# Specifications

## MF 410/420/430 WIRING DIAGRAM



# Specifications

## Key to wiring diagram

|     |                         |     |                               |
|-----|-------------------------|-----|-------------------------------|
| 1.A | Fuse box - input        | 20  | Alternator                    |
| 1.B | Fuse box - output       | 21  | 4WD                           |
| 3   | Ignition switch         | 22  | Oil filter- steering          |
| 4   | Horn / Light switch     | 23  | ESOS                          |
| 5.A | Instrument Panel socket | 24  | Auto Advance Unit             |
| 5.B | Instrument Panel socket | 25  | Glow Plug                     |
| 6   | Hazard warning switch   | 26  | PTO safety start sw.          |
| 7   | Turn signal switch      | 27  | Transmission safety start sw. |
| 8   | Flasher                 | 28  | Starter                       |
| 9   | -----                   | 29  | Horn                          |
| 10  | Starter relay           | 31A | Beams RH                      |
| 11  | Heater relay            | 31B | Beams LH                      |
| 13  | Brake switch            | 33  | Number plate                  |
| 14  | IPTO oil pressure       | 34  | Trailer socket                |
| 15  | Fuel sender             | 35  | Work lamp (plough light)      |
| 16  | Temperature sw.         | 46A | Front parking lamp RH         |
| 17  | Air cleaner filter      | 47A | Front parking lamp LH         |
| 18  | Engine oil pressure sw. | 46B | Brake lamp RH                 |
| 19  | Hand brake sw.          | 47B | Brake lamp LH                 |
| 48  | Fuel lift pump          | 52  | Line fuse                     |

Table 21

# Specifications

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